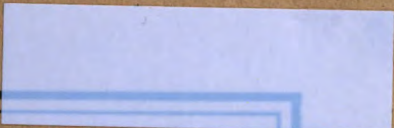


W 3.63:3 PT. 1 / ch. 1



WAR DEPARTMENT

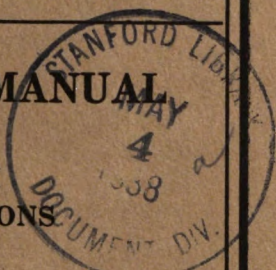
BASIC FIELD MANUAL



**Volume III
BASIC WEAPONS**

**PART ONE
RIFLE COMPANY**

**CHAPTER 1
RIFLE MARKSMANSHIP
U. S. RIFLE, CALIBER .30, M1903**



BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 1 RIFLE MARKSMANSHIP U. S. RIFLE, CALIBER .30, M1903

Prepared under direction of the
Chief of Infantry



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1938

For sale by the Superintendent of Documents, Washington, D. C.
Price 15 cents

35

412SU

XL

10/06

31150-119

3815



Google

WAR DEPARTMENT,
WASHINGTON, January 3, 1938.

Chapter 1 (Rifle Marksmanship, U. S. Rifle, Caliber .30, M1903), Part One (Rifle Company), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (4-21-37).]

BY ORDER OF THE SECRETARY OF WAR:

MALIN CRAIG,
Chief of Staff.

OFFICIAL:

E. T. CONLEY,
Major General,
The Adjutant General.

TABLE OF CONTENTS

	Paragraph	Page
SECTION I. Description of the rifle:		
General.....	1	1
Rates of fire and effective range.....	2	1
Nomenclature.....	3	1
SECTION II. Care and cleaning of the rifle:		
Importance of proper care.....	4	1
Inspections.....	5	3
Care and cleaning in garrison.....	6	3
Care and cleaning after firing.....	7	4
Metal fouling.....	8	5
Rules for the care of the rifle on the range.....	9	7
SECTION III. Functioning of the rifle:		
Bolt mechanism.....	10	7
Magazine mechanism.....	11	8
Precautions.....	12	8
SECTION IV. General provisions governing preparatory exercises:		
Methods of procedure.....	13	9
Duties of leaders and commanders; equipment for each squad.....	14	10
SECTION V. Training sequence:		
Instruction.....	15	13
SECTION VI. First step; sighting and aiming:		
First sighting and aiming exercise.....	16	20
Second sighting and aiming exercise.....	17	24
Third sighting and aiming exercise.....	18	24
SECTION VII. Second step; positions:		
Instruction in position.....	19	26
General rules for positions.....	20	31
Prone position.....	21	32
Sandbag rest position.....	22	33
Sitting position.....	23	35
Kneeling position.....	24	35
Standing position.....	25	35
Positions in standing trench.....	26	36
Position exercises.....	27	38
Assuming prone position rapidly.....	28	39
Assuming sitting position rapidly.....	29	43
SECTION VIII. Third step; trigger squeeze:		
Importance of trigger squeeze.....	30	45
Calling the shot.....	31	46
Trigger-squeeze exercise.....	32	46

IV

		Paragraph	Page
SECTION IX. Fourth step; rapid fire:			
General principles.....	33	47	
Bolt-operation exercise.....	34	48	
Rapid-fire exercise.....	35	50	
SECTION X. Effect of wind; sight changes; use of score book:			
Wind.....	36	51	
Wind rule.....	37	52	
Wind-gage rule.....	38	53	
Mirage.....	39	53	
Elevation rule.....	40	53	
Light.....	41	54	
Zero of a rifle.....	42	54	
Canting the rifle.....	43	55	
Shooting up or down hill.....	44	55	
Sight-setting and sight-changing exercises.....	45	55	
Use of the score book.....	46	57	
Score-book exercises.....	47	58	
SECTION XI. Fifth step; examination of men before starting range practice:			
Examination.....	48	60	
SECTION XII. Small-bore practice:			
Object.....	49	65	
Value.....	50	66	
Continuous small-bore practice.....	51	66	
Courses to be fired.....	52	66	
SECTION XIII. Caliber .30 practice:			
General principles.....	53	72	
Importance of correct trigger squeeze.....	54	72	
Order of firing.....	55	72	
Use of sandbag rest.....	56	73	
Pads.....	57	73	
Coaching.....	58	73	
Final precautions for slow fire.....	59	76	
Rapid fire.....	60	77	
Final word.....	61	78	
General provisions governing courses.....	62	78	
Course A.....	63	79	
Course B.....	64	82	
Course C.....	65	84	
Course D.....	66	85	
SECTION XIV. General provisions governing range practice:			
Permanent range personnel.....	67	86	
Range officers.....	68	86	
Noncommissioned officer in charge of the pit.....	69	87	
Order of instruction and record practice.....	70	87	
Uniform.....	71	88	
Equipment.....	72	88	
Safety precautions.....	73	88	
SECTION XV. Procedure governing record practice:			
Organization of the firing line.....	74	88	
Target details.....	75	88	
Score cards and scoring.....	76	89	

SECTION XV. Procedure governing record practice—Continued.	Paragraph	Page
Marking.....	77	90
Procedure.....	78	91
Use of telephones.....	79	96
SECTION XVI. Rules governing record practice:		
Men marking targets not to know who is firing.....	80	96
Coaching prohibited.....	81	97
Use of instruments.....	82	97
Shelter for firer.....	83	97
Restrictions as to the rifle.....	84	97
Trigger pull.....	85	97
Ammunition.....	86	97
Cleaning.....	87	97
Use of gun sling.....	88	98
Pads and gloves.....	89	98
Loading pieces.....	90	98
Warming or fouling shots.....	91	98
Sighting shots.....	92	98
Shots cutting the edge of bull's-eye or line.....	93	98
Slow-fire score interrupted.....	94	98
Misses.....	95	99
Accidental discharges.....	96	99
Firing on wrong target.....	97	99
Two shots on same target.....	98	99
Withdrawing target prematurely.....	99	99
Misfires in rapid fire.....	100	99
Unfired cartridges in rapid fire.....	101	99
Disabled rifle in rapid fire.....	102	100
More than 10 hits in rapid fire.....	103	100
SECTION XVII. Targets and ranges:		
Targets.....	104	100
Principles governing selection.....	105	101
Principles governing construction.....	106	102
SECTION XVIII. Advice to instructors:		
Provisions not mandatory.....	107	105
Size of class.....	108	105
Place of assembly for lectures.....	109	106
Assistant instructors.....	110	106
Inspection of equipment.....	111	106
Inspection of rifles.....	112	107
Ammunition.....	113	107
Organization of the work.....	114	108
Model schedules.....	115	110
Value of lectures.....	116	112
Method of giving lectures.....	117	112
First lecture; sighting and aiming.....	118	113
Second lecture; positions.....	119	115
Third lecture; trigger squeeze.....	120	117
Fourth lecture; rapid fire.....	121	119
Fifth lecture; effect of wind and light, sight changes, score book.....	122	121
Sixth lecture; range practice.....	123	122

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 1

RIFLE MARKSMANSHIP

U. S. RIFLE, CALIBER .30, M1903

(This chapter supersedes chapter 1, part one, *Basic Field Manual*, Volume III, March 1, 1932.)

SECTION I

DESCRIPTION OF THE RIFLE

1. **General.**—The United States rifle, caliber .30, M1903, is a breech-loading magazine rifle of the bolt type.

2. **Rates of fire and effective range.**—The normal rate for rapid fire is 10 aimed shots per minute. As the effectiveness of rifle fire during combat falls off beyond a range of 600 yards, its use at greater ranges is therefore unusual.

3. **Nomenclature.**—Names of the parts habitually referred to in drill and target practice are all the knowledge necessary for nomenclature. When time permits, the parts named in figures 1 and 2 should be pointed out and the functions of each explained.

SECTION II

CARE AND CLEANING OF THE RIFLE

4. **Importance of proper care.**—The rifle is a piece of fine mechanism. It must be kept clean, free from rust, and well lubricated if it is to do good work and remain in serviceable condition. The cleaning and care of the rifle is an important duty to be performed by all soldiers armed with this weapon, and a subject which merits the serious consideration of all officers. Experience has shown that the majority of rifles become unserviceable, not through shooting but through the lack of intelligent and proper care. The use of materials other than those authorized for the specific purposes mentioned is strictly forbidden.

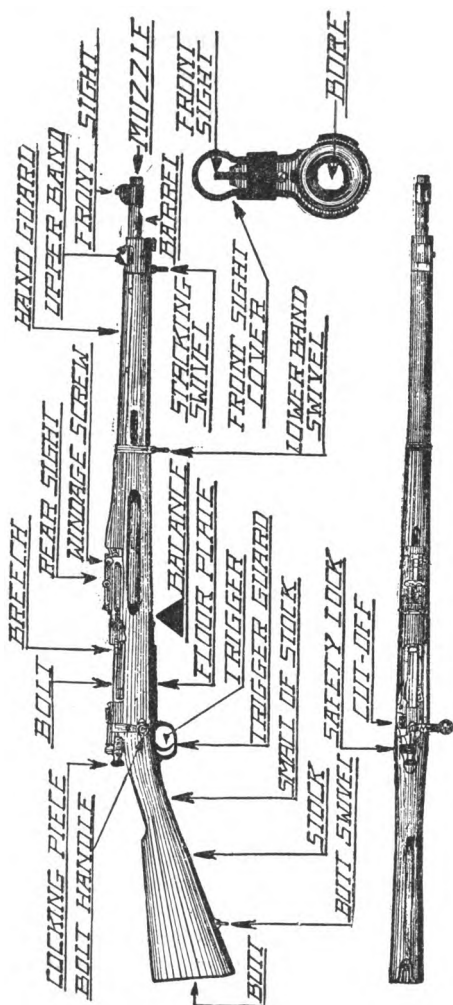


FIGURE 1.—Springfield rifle, M1903.

5. **Inspections.**—At all inspections, unless otherwise explicitly ordered, the rifles will be clean, the bore of the rifle protected with a thin film of grease (cosmic), the mechanism of the rifle lubricated with thin oil (sperm oil), and the oiler filled with oil. When the inspector wishes to inspect the rifles minutely he may order that all grease and oil be removed from

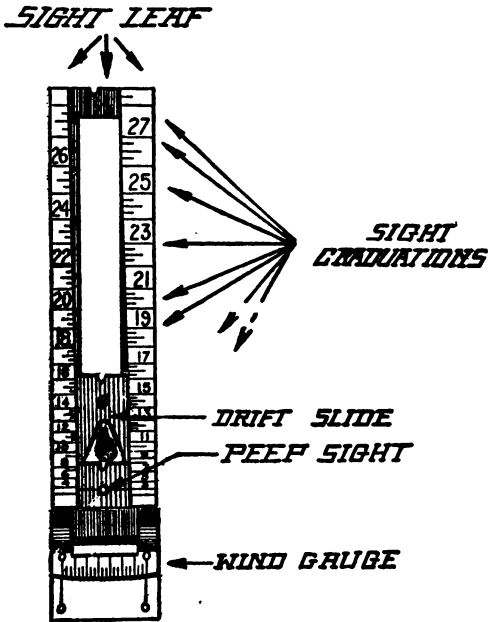


FIGURE 2.—Rear sight.

them; but in such cases the grease and oil will be applied again immediately after the inspection, and the inspector will allot a specific time for so doing.

6. **Care and cleaning in garrison.**—*a.* Care and cleaning in garrison includes the ordinary care of the rifle to preserve its

condition and appearance in garrisons, posts, and camps during those periods when no firing is done.

b. Damp air and sweaty hands are great promoters of rust. The rifle should be cleaned and protected after every drill. Special precautions are necessary when the rifles have been used on rainy days and after tours of guard duty.

c. The barrack cleaning rod only will be used. The use of the thong and brush will be confined to occasions when the barrack cleaning rod is not available. Rifles will always be cleaned from the breech, the bolt being removed during cleaning for this purpose.

d. The following parts of the rifle may be removed by the soldier for the purpose of cleaning: Front sight cover, floor plate and follower, gun sling, oiler and thong case, and the bolt, which may be taken apart.

e. To clean the rifle, rub it with a rag which has been slightly oiled or greased, and then clean with a perfectly dry rag. Swab the bore with an oily flannel patch and then with a perfectly dry one. Dust out all screw heads and crevices with a small, clean brush. Wipe the stock and sling with an oily rag and then with a perfectly dry one.

f. Immediately after cleaning, to protect the rifle, swab the bore thoroughly with a flannel patch saturated with grease (cosmic), wipe over all metal parts, including the bolt mechanism and magazine, with an oily rag, apply a few drops of light oil (sperm oil) to all cams and working surfaces of the mechanism, place a teaspoonful of linseed oil in the palm of the hand, and polish the stock well.

g. After cleaning and protecting the rifle, place it in the gun rack without any covering whatever. The use of canvas or similar covers for the rifle is prohibited, as they collect moisture and rust the metal parts. When the barracks are being swept, gun racks may be covered with a piece of canvas to protect the rifles from dust.

7. Care and cleaning after firing.—*a.* When a rifle has been fired, the bore must be thoroughly cleaned, not later than the evening of the day on which it is fired. Thereafter it must be

wiped out and regreased each day for the next three succeeding days at least.

b. To clean the bore after firing, insert the muzzle in a vessel containing hot water and issue soap, hot water alone, or cold water; the cleaning rod with a cloth patch assembled is inserted in the breech and moved forward and back for about one minute, pumping the water in and out of the bore. While the bore is wet a brass or bronze wire brush, if available, should be run all the way through the bore, then all the way back three or four times. Water should again be pumped through the bore. Then wipe the cleaning rod dry, remove barrel from water, and, using dry, clean flannel patches, thoroughly swab the bore until it is perfectly dry and clean, being careful to see that the chamber is also dried and cleaned. Hold the breech of the barrel pointed toward the sky and examine the bore carefully for metal fouling.

c. If no metal fouling is present, saturate a clean flannel patch with grease (cosmic) or the oil issued for this purpose by the Ordnance Department and swab the bore and chamber thoroughly with the patch, making certain that the bore and all metal parts of the rifle are covered with a thin coating of grease or oil.

8. Metal fouling.—*a. Description.*—If small smears, flakes, or lumps which look like dull lead are seen on the surface of the bore near the muzzle or for about 6 inches down from the muzzle, they are metal fouling and must be removed.

b. Removal.—(1) Metal fouling will be removed only by an instructor, noncommissioned officer, or mechanic. Selected noncommissioned officers and mechanics will be instructed in the method of removing metal fouling.

(2) Metal fouling should be removed at once, for not only is it detrimental to accuracy, but the bore will rust very quickly on the portions covered by this fouling. To remove metal fouling proceed as follows: The bore should be free from primer and powder fouling and the barrel should be cold. Place a rubber stopper in the chamber so as to seal the bore at that point. Place a 2-inch section of rubber tube over the muzzle so that about an inch of the tube extends above the muzzle. Stand the

rifle, muzzle up, in a rack. Carefully pour the standard metal-fouling solution into the bore from the muzzle until the solution rises in the rubber tube, completely covering the muzzle. If any solution is spilled on the exterior of the barrel, wipe it off at once. The solution should be permitted to remain in the bore from 15 to 20 minutes and never longer than 30 minutes under any circumstances. *The solution should never be used in a hot barrel.* Pour the solution out of the bore, remove the rubber stopper from the chamber and the rubber tube from the muzzle, allow any remaining solution to drain out, and at once pump water through the bore in order to remove all traces of the metal-fouling solution. Finally dry the bore and apply oil or grease as prescribed for regular cleaning. The ammonia solution dissolves the metal fouling. When tracer ammunition has been used it may be necessary to apply the solution three or four times to remove the large amount of metal fouling deposited.

(3) The standard metal-fouling solution is prepared as follows:

Ammonium persulphate: 1 ounce, or 2 heaping tablespoonfuls.

Ammonium carbonate: 200 grains, or 1 heaping tablespoonful.

Ammonia, 28 percent: 6 ounces, or $\frac{3}{8}$ pint, or 12 tablespoonfuls.

Water: 4 ounces, or $\frac{1}{4}$ pint, or 8 tablespoonfuls.

The spoon referred to is the M1910 spoon issued in the mess kit. Powder the persulphate and carbonate together (place them inside a clean cloth and grind with tool handle); dissolve in water and add the ammonia; mix thoroughly until about 90 percent of the powder is dissolved and allow to stand for one hour before using. It should be kept in a strong bottle, tightly rubber corked and in a cool place. In order to preserve the strength of the solution the bottle should be opened only for the time necessary to pour out the amount required. The solution, when mixed, should be used within 30 days. The above amount is sufficient to clean out about six barrels. The solution should

not be used more than twice, and used solution should not be mixed with unused solution, but should be bottled separately. Care should be used in mixing and using this solution to prevent injury to the rifle. If the solution is allowed to evaporate on steel, the latter will rust very quickly. An experienced non-commissioned officer should mix the solution and superintend its use. When new type ammunition containing bullets jacketed with copper (gilding metal) is used, the ammonia swabbing solution (see par. 35*b* (3), TR 320-10) will usually suffice to remove the slight, thin plating of copper on the surface of the bore which sometimes occurs with such ammunition.

9. Rules for the care of the rifle on the range.—*a.* Wipe out the bore with a clean cloth patch each time before going to the firing point.

b. Always clean at the end of each day's shooting. A rifle that has been fired should never be left overnight without cleaning.

c. Never fire a rifle with any dust, dirt, mud, or snow in the bore.

d. Never leave a patch, oily rag, cork, or other obstruction in the bore or anything sticking in the muzzle.

e. During range firing a noncommissioned officer will be placed in charge of the cleaning of rifles at the cleaning racks.

SECTION III

FUNCTIONING OF THE RIFLE

10. Bolt mechanism.—*a.* To open the bolt, raise the handle until it comes in contact with the left side of the receiver and pull directly to the rear until the bolt stops. To close the bolt, push the handle forward and turn it down as far as possible; the rifle will not fire unless the handle is down. The opening and closing of the bolt should each be done by one continuous motion.

b. The piece may be cocked either by raising the bolt handle until it strikes the left side of the receiver and then immediately turning it down, or by pulling the cocking piece directly to the rear.

c. To remove the bolt, turn the cut-off midway between the "off" and "on" positions and then pull the bolt to the rear. To replace the bolt, the cut-off must be in the same position.

11. Magazine mechanism.—a. To load the magazine, turn the cut-off up, showing "on"; draw the bolt fully to the rear; insert the cartridges in the magazine from a clip as follows: Place one end of a loaded clip in its seat in the receiver, and, with the fingers of the right hand under the rifle against the floor plate, and the base of the right thumb on the powder space of the top cartridge near the clip, press the cartridges down with the thumb into the magazine until the top cartridge is caught by the right edge of the receiver. If the magazine already contains some cartridges, it can be completely filled by inserting cartridges singly.

b. After loading the magazine, to place a round in the chamber, close the bolt.

c. When the cut-off is turned down the magazine is "off." The bolt cannot be drawn fully back, and its front end, projecting over the rear end of the upper cartridge, holds the latter down in the magazine below the action of the bolt. The magazine mechanism then remains inoperative, and the arm can be used as a single-loader as when the magazine is empty or with the cartridges in the magazine held in reserve.

d. In magazine fire, after the last cartridge has been fired and the bolt drawn fully to the rear, the follower rises and holds the bolt open to show that the magazine is empty.

12. Precautions.—a. If it is desired to carry the piece cocked with a cartridge in the chamber, the bolt mechanism should be secured by turning the safety lock to the right. Under no circumstances should the firing pin be let down by hand on a cartridge in the chamber.

b. If a misfire occurs, it is unsafe to draw back the bolt immediately as it may be a hangfire. In such cases the piece should be again cocked by drawing back the cocking piece and refired.

SECTION IV

GENERAL PROVISIONS GOVERNING PREPARATORY EXERCISES

13. Methods of procedure.—a. Object.—The object of this chapter is to provide a thorough and uniform system of conducting rifle training throughout the military service.

b. Regular practice season.—(1) Under ordinary conditions the regular practice season for the Regular Army will cover a period of not more than 3 weeks for each organization. A period of not more than 1 week is devoted to preparatory exercises and 2 weeks to range practice. When unforeseen circumstances are such as to cause a delay during the period of instruction the time may be extended by the post commander.

(2) Whenever possible during record practice such officers as may be required for duty in the pit will be detailed from troops not firing.

(3) The regular practice season for units of the National Guard and the Organized Reserves will be of such duration and ordered at such times as may be best suited for effective training.

(4) So that officers and enlisted men of the Regular Army, National Guard, and Organized Reserves may be familiar with their exact duties of marksmanship training during mobilization, organizations should not exceed the number of hours set forth in model schedules (par. 115). Under no conditions will any man be given range practice until he has had a thorough course in the preparatory exercises.

c. Supplementary practice season.—Supplementary practice is not necessary when the regular practice season has been efficiently conducted, except in cases where a large number of unqualified men join the organization after the regular practice season. The supplementary practice season is usually placed as late in the fall as is consistent with efficient instruction. However, this practice may be held at any time when circumstances make it advisable.

d. Continuous practice.—Rifle practice is not limited to a particular season. Subject to ammunition allowances, commanding officers will adopt such measures as may be necessary to

maintain a high state of excellence in rifle firing throughout the year. The particular measures adopted will depend upon the facilities near the post or station. The measures taken may provide for competitions between individuals or organizations or the encouragement of small-bore rifle teams.

e. Recruit instruction.—As part of their recruit training, all recruits armed with the rifle will be thoroughly instructed in the following fundamental elements of rifle marksmanship: Nomenclature, safety precautions, care of the rifle, sighting and aiming, positions, trigger squeeze, and rapid fire. They will be given a final examination and will fire the small-bore qualification course as prescribed in paragraph 52. Instruction in rifle marksmanship will commence with the initial instruction of the recruit and will continue throughout the period of recruit training.

f. Apparatus.—The use during instruction practice of complicated apparatus which cannot be readily improvised from materials at hand is prohibited. The simple apparatus described in paragraph 14*b* is ample for all purposes.

14. Duties of leaders and commanders; equipment for each squad.—*a. Duties of leaders and commanders.*—(1) *Squad leader.*—(a) Organizes the work in his squad so that each man is occupied during the preparatory period in the prescribed form of training for target practice.

(b) Examines each man in his squad at the end of the training on each preparatory step and assigns him a mark in the proper place on the blank form.

(c) Sees that each man takes proper care of his rifle and that he cleans it at the end of each day's firing.

(d) Enforces correct aiming, position, and trigger squeeze when fire is simulated in drills and maneuvers.

(2) *Sergeant.*—Assists the squad leaders and performs any other duties assigned him by the platoon and company commanders.

(3) *Platoon leader.*—Supervises and directs the squad leader in training his squad; personally checks each man in his platoon on the points enumerated in the blank form; and examines each man along the lines outlined in paragraph 48.

(4) *Company commander*.—Requires the prescribed methods of instruction and coaching to be carried out carefully and in detail; supervises and directs the squad and platoon leaders; in companies of less than 60 men, performs the duties prescribed in (3) above for platoon leaders.

(5) *Battalion commander*.—Requires the officers and non-commissioned officers to be familiar with and understand the prescribed methods of instruction and coaching; supervises the instruction within his battalion and requires the companies to follow out the preparatory exercises and methods of coaching carefully and in detail.

(6) *Officer in charge of rifle instruction*.—Appointed by the post or regimental commander to supervise the preparatory work and range practice in the post or regiment when, in the opinion of the post or regimental commander, such action is advisable. Should an officer in charge of instruction be appointed, he will be selected for his ability as a rifle instructor, and should be an officer who has been through a course of instruction under the methods prescribed herein. His duties are as follows: To inspect the equipment for preparatory training two or three days in advance of the time such training is to begin; to see that it is properly made, and is serviceable and neat in appearance; to act as chief instructor for the organizations under his supervision; to assist the organization commanders in applying the proper methods; to correct errors and mistaken ideas on interpretations of the text; and to keep the regimental or post commander informed as to the progress being made during the preparatory period and range practice.

b. Equipment for each squad.—(1) *List*.

(a) Two sighting bars complete.

(b) Two rifle rests.

(c) Two small sighting disks.

(d) Four small aiming targets.

(e) One 10-inch sighting disk.

(f) Two small boxes.

(g) One frame covered with blank paper for long-range triangles.

(h) Two sandbags.

- (i) One aiming device.
- (j) Fifteen rounds practice dummy ammunition for each man.
- (k) One score book for each man.
- (l) Two blank examination forms for each squad.
- (m) One rapid-fire target with curtain for each three squads.
- (n) Eight feet of twine for tying triggers to trigger guard.
- (o) One each A, B, and D targets on frames for score-book exercises.

(p) Material for blackening sights.

(2) *Preparation of equipment.*—(a) *Sighting bar.*

1. Provide a bar of wood about 1 by 2 inches and $4\frac{1}{2}$ feet long. Cut two thin slots 1 inch deep across the edge. Place one slot $5\frac{1}{2}$ inches from the end and the other 26 inches from the same end of the bar (fig. 3 ②).
2. Make a front sight of thin metal $\frac{1}{2}$ by 3 inches bent in the shape of an L and tack it to the edge of the bar between the two slots and $\frac{1}{2}$ inch from the slot nearest the end (fig. 3 ④ (d) and (g)). Have the leg of the L project above the bar $\frac{1}{2}$ to $\frac{3}{4}$ of an inch (fig. 3 ③).
3. Make an eyepiece from a piece of tin or zinc 3 by 7 inches (fig. 3 ④ (c), (f), and (h)). Cut along the dotted lines to form a shape shown in figure. Tack this eyepiece to the end of the bar farthest from the slots so that the top of the eyepiece extends 1 inch above the top of the bar (fig. 3 ③). Make a round hole 0.03 inch in diameter in the middle of the eyepiece $\frac{1}{2}$ inch above the bar.
4. Make a peep rear sight of thin metal or cardboard 3 by 3 inches and cut a round hole $\frac{3}{4}$ inch in diameter in its center (fig. 3 ④ (b)).
5. Cut an open rear sight of thin metal or cardboard $1\frac{1}{2}$ by 3 inches with a semicircular notch $\frac{3}{4}$ inch wide in the middle of one of the long edges (fig. 3 ④ (e)).
6. Cut a piece of thin metal or cardboard 3 by 3 inches, painted white, and have a black bull's-eye $\frac{1}{2}$ inch in diameter painted or pasted on the center (fig. 3 ④ (a)).

7. Place two pieces of tin 1 inch wide and 3 inches long in each slot. Fold the loose ends away from each other and tack them to the sides of the bar (fig. 3 ③).

8. Blacken the eyepiece, the front sight, the rear sights, and the top of the bar.

(b) *Rifle rest*.—An empty ammunition box or any other well-made box of suitable size, with notches cut in the ends to fit the rifle closely, makes a good rifle rest. The rifle is placed in these notches with the trigger guard close to and outside of one end. The sling is loosened and pulled to one side. The box is half filled with earth or sand to make it more stationary.

(c) *Sighting disks*.—Sighting disks are of three sizes. The disk to be used at a distance of 50 feet is about 3 inches in diameter. The disk is made of tin or cardboard and mounted on a handle, as shown in figure 4. The bull's-eye will be mounted on a background of clean white paper. The disks to be used at 200 and 500 yards are, respectively, 10 and 20 inches in diameter. These disks are painted black and mounted on white handles which are 4 or 5 feet long. All bull's-eyes will be black and circular and will have a hole in the center large enough to admit the point of a pencil.

(3) *Range equipment, etc.*—The range will be provided with benches, cleaning racks, and scorers' tables.

SECTION V

TRAINING SEQUENCE

15. *Instruction*.—a. *Object*.—(1) Military rifle training is divided into two parts: *Rifle marksmanship* (known-distance firing) in which the men are taught individually to be good shots; and *musketry* in which they learn to act as a team under the leadership of the squad, section, and platoon leaders to obtain the maximum fire effect on an enemy.

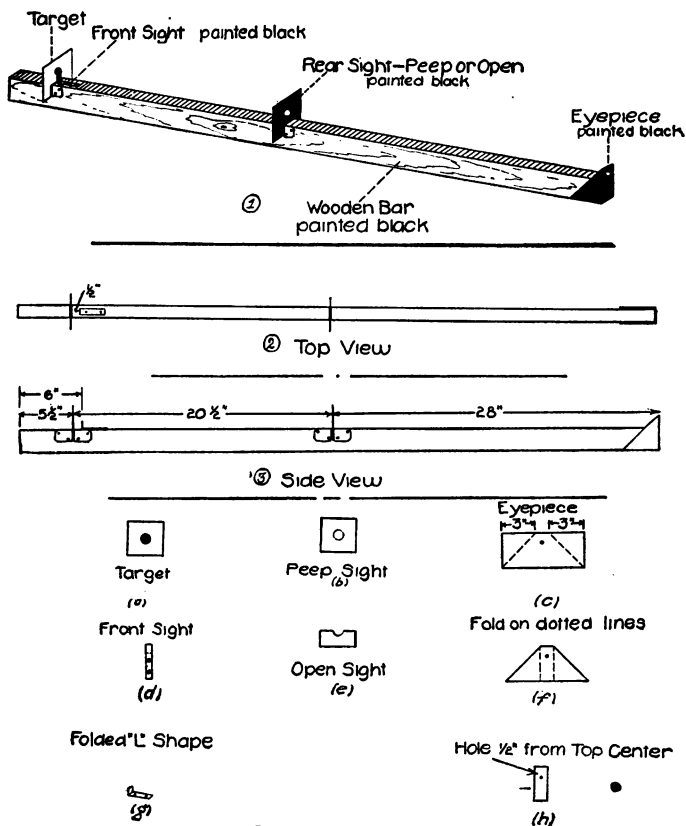


FIGURE 3.—Construction of sighting bar.

Wooden bar—1 by 2 inches by 4 feet 6 inches (approximate).
 Eyepiece—Thin metal, 3 by 7 inches; hole, 0.03-inch diameter.
 Rear sight—Thin metal or cardboard, 3 by 3 inches; hole in center, 3/4-inch diameter.
 Front sight—Thin metal, 1/2 by 3 inches, bent L shape.
 Target—Thin metal, or cardboard, 3 by 3 inches, painted white—Black bull's-eye, 3/4-inch diameter in center.
 Slits—1 inch deep, may be lined with thin metal strips.

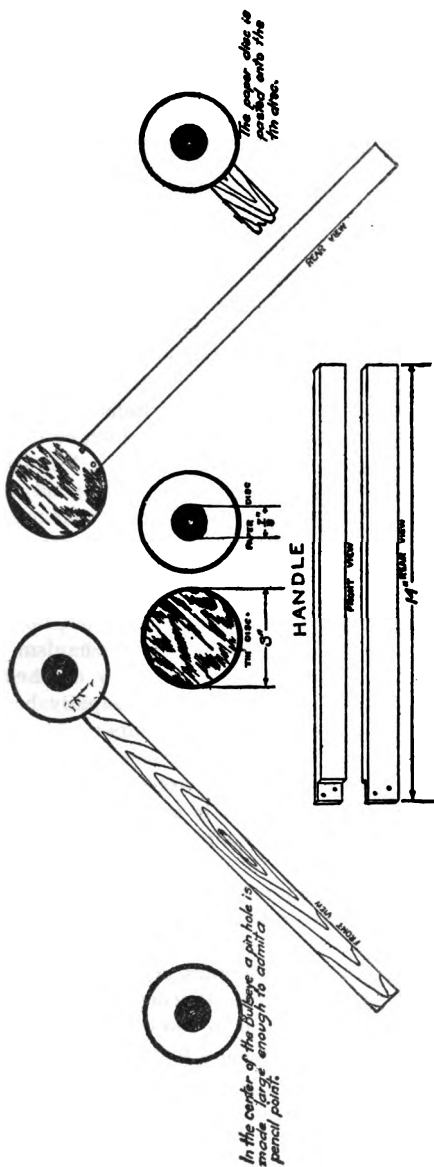


FIGURE 4.—Sighting disk.

(2) Rifle marksmanship and musketry are inseparably related. Neither one alone will win battles without undue losses. In all training on the rifle range it must be borne in mind that the ultimate object is to qualify for a team whose accurate fire can be controlled, directed, and distributed in battle by a leader.

b. Basis.—(1) Rifle firing is a mechanical operation which anyone who is physically and mentally fit to be a soldier can learn to do well if properly instructed. The methods of instruction are the same as those used in teaching any mechanical operation. The soldier is taught the various steps in their proper order. He is carefully watched and is corrected whenever he starts to make a mistake.

(2) Men instinctively do the wrong thing in firing the rifle. They give the trigger a sudden pressure which causes flinching. Consequently men cannot be taught to shoot by placing them alone on the firing line with ammunition to expend and targets at which to shoot in front of them. The idea that mere practice will ultimately make them perfect is wrong. Such procedure merely fixes the instinctively bad habits in the average man and makes it extremely difficult for anyone to teach him to shoot, even with the proper methods. If he has, however, been thoroughly instructed and drilled in the mechanism of correct shooting, and is then carefully and properly coached when he begins firing, the correct shooting habits rapidly become fixed and replace the instinctively incorrect habits that he would have developed if left alone.

(3) It is much easier to make an excellent shot out of a man who has never fired a rifle than it is to correct the errors of a man who has done a good deal of shooting under improper supervision.

(4) For duties of leaders and commanders in connection with the organization and supervision of the preparatory exercises see paragraph 14.

c. Methods.—(1) (*a*) The preparatory exercises have a two-fold purpose; to teach the man the correct way to do each of the essentials, and to drill him in the correct method of doing these essentials until they become fixed habits. The prepara-

tory exercises constitute five distinct steps, as follows, and should be given in a concentrated period of time:

1. Sighting and aiming exercises.
2. Position exercises.
3. Trigger-squeeze exercises.
4. Rapid-fire exercises.
5. Examination of men before starting range practice.

(b) In addition, the following subjects will be taken up during the preparatory period: Nomenclature, care of the rifle, effect of wind, use of score book, and sight changing. These items do not pertain particularly to any one step, but will be taken up before the examination. As a rule the time spent indoors during inclement weather can be utilized in the study of these subjects.

(c) Each of the first four steps given in (a) above starts with a lecture by the instructor to the assembled command. This talk includes a demonstration by a squad which the instructor puts through the exercises that are to constitute the day's work. He shows exactly how to do the exercises that are to be taken up and explains why they are done and their application to rifle shooting. He shows how the corporal organizes the work in the squad so that no men are idle and how they coach each other when they are not under instruction by an officer or noncommissioned officer.

(d) These talks and demonstrations are an essential part of the training. If properly given they awaken the interest and enthusiasm of the whole command for the work and give an exact knowledge of how each step is to be carried on; something that men cannot get from reading a description, no matter how accurate and detailed that description may be.

(e) The instructor who gives these talks and demonstrations may be the platoon leader of his platoon, the company commander of his company, or the battalion commander of his battalion; or he may be an especially qualified officer who has been detailed as officer in charge of rifle instruction. The instructors who apply the demonstrated exercises to the men of the command are the officers and noncommissioned officers of the units undergoing instruction.

(f) The number of men who can be taught to shoot at one time by a good instructor is limited only to those who can hear his voice and see the demonstration. Regiments of over 3,000 officers and men who were totally ignorant of shooting matters have been put through preliminary work and range practice under one instructor with excellent results. As only one step is taken up at a time, and as each step begins with a lecture and a demonstration showing exactly what to do, the officers and non-commissioned officers, although not previously instructed, can carry on the work under the supervision of the instructor. It is best, of course, to have the officers and noncommissioned officers instructed in advance, but such a course is not essential where armies are being hastily organized and time is not available.

(g) The instruction must be thorough and it must be individual. Each man must understand every point and be able to explain each one in his own words. Each man must be brought to as high a state of proficiency on all of the enumerated points as the time allowed for preparatory work will permit. The company commander will carefully supervise the work. He will pick out men at random through the different platoons from time to time and put them through a test to see if the instruction is thorough and is progressing satisfactorily.

(h) The blank form shown in (3) below must be kept by each squad leader and by each platoon leader independently of the squad leader. This blank form shows at a glance just how much each man knows about each point.

(i) The importance of exactness should be impressed on the men at all times. For example, men in adjusting the sights in the sighting drills or shot group exercises are apt to say, "That is about right." There is no such thing as a sight that is about right; it is absolutely right or it is all wrong. Exactness in every detail is hard to get, but it must be attained.

(j) Interest and enthusiasm must be sustained and everything possible should be done to stimulate them. If the exercises are gone through in a manner approximately correct and as a routine piece of work, the results will be very disappoint-

ing. As soon as these exercises deteriorate into a perfunctory performance of physical exercise they do more harm than good.

(*k*) Careful attention will be paid to the essential points as shown in the form of questions and answers under the heading "Examination" (par. 48). This will be consulted by the instructor during each step of the preparatory work. Each man will be put through a thorough test along the line indicated in these questions and answers before he is allowed to fire.

(*l*) The most important point of all is the trigger squeeze, and every effort should be made at the very beginning of range practice to correct trigger-squeeze errors. The best method of correcting flinching, which is always the visible sign of trigger-squeeze error, is for the coach to press the trigger while the man under instruction holds and aims the rifle.

(*m*) Whenever a man is in a firing position, whether it be at preparatory exercises, at gallery practice, or on the range, a coach will be placed beside him to watch him and point out his errors. The coach will watch the man himself. If a coach watches the target, he is of no assistance to the man firing.

(*n*) Every man who is to fire on the range will be put through the entire preparatory course. No distinction will be made between recruits and men who have had range practice, no matter what their previous qualification has been. Some part of the preparatory instruction may have escaped them in previous years; it is certain that some of it has been forgotten, and in any case it will be helpful to go over it again and refresh the mind on the subject.

(*o*) When necessary and when time permits, all of the non-commissioned officers of the company should be put through a course of instruction and required to pass a rigid test before the period of preparatory training for the company begins.

(*p*) Range practice is taken up immediately after completion of the preparatory exercises.

(2) Instruction is carried on throughout the entire period of training by the *coach-and-pupil method*. Under this method the men undergoing instruction are grouped in pairs and take turns in watching and coaching each other. The man undergoing instruction is called the pupil. The man giving instruc-

tion is called the coach. When the men of a pair change places the pupil becomes the coach and the coach becomes the pupil. The squad leaders and commanders of higher units are the instructors. The instructors supervise and prompt the men who are acting as coaches.

(3) *Form showing state of instruction.*

[illegible]

METHOD OF MARKING

Fair:

X

 Good:

X	X
---	---

 Very good:

X	X	X
---	---	---

 Excellent:

X	X	X	X
---	---	---	---

 Excellent and has instructional ability:

X	X	X	X
---	---	---	---

SECTION VI

FIRST STEP; SIGHTING AND AIMING

16. First sighting and aiming exercise (fig. 5).—a. The instructor or squad leader shows a sighting bar to his group or squad and points out the front and rear sights, the eyepiece, and the removable target. He explains the use of the sighting bar as follows:

- (1) The front and rear sights on the sighting bar represent enlarged rifle sights.
- (2) The sighting bar is used in the first sighting exercise because with it small errors can be easily seen and explained to the pupil.

(3) The eyepiece requires the pupil to place his eye in such position that he sees the sights in exactly the same allnement as seen by the coach.

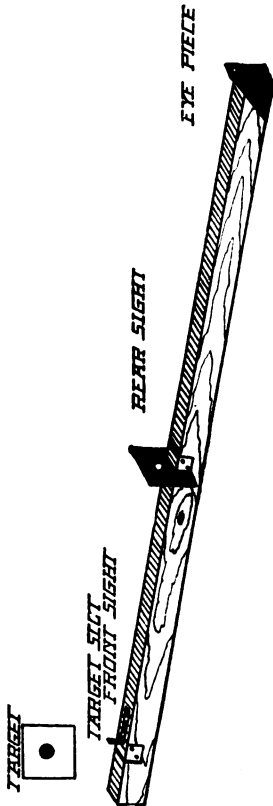


FIGURE 5.—The sighting bar.

(4) There is no eyepiece on the rifle, but the pupil learns by use of the sighting bar how to aline the sights properly when using the rifle.

(5) The removable target attached to the end of the sighting bar is a simple method of readily alining the sights on a bull's-eye.

b. The instructor explains the open and the peep sight to the assembled group, showing each man the illustrations of a correct sight alinement (fig. 6 ①, ②, ④, and ⑤).

c. The instructor, first with the peep sight and then with the open sight, adjusts the sights of the sighting bar, with target removed, to illustrate a correct alinement of the sights. He has each man of the assembled group look through the eyepiece at each of the sight adjustments.

d. The instructor adjusts the sights of the sighting bar with various small errors in sight alinement and has each man of the assembled group endeavor to detect the error.

e. The instructor describes a correct aim, showing the illustration to each man. He explains that the top of the front sight is seen through the middle of the circle and just touches the bottom of the bull's-eye, so that all of the bull's-eye can be clearly seen (fig. 6 ③ and ⑥).

f. The instructor explains that the eye should be focused on the bull's-eye in aiming, and he assures himself, by questioning the pupils, that each man understands what is meant by focusing the eye on the bull's-eye.

g. The instructor adjusts the sights of the sighting bar and the removable target so as to illustrate a correct aim and has each man of the group look through the eyepiece to observe this correct aim.

h. The instructor adjusts the sights and the removable target of the sighting bar so as to illustrate various small errors and has each man in the group attempt to detect the error.

i. The exercise described above having been completed by the squad leader or other instructor, the men are placed in pairs and repeat the exercise by the coach-and-pupil method.

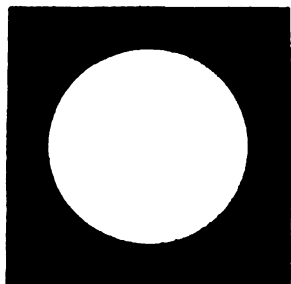
j. As soon as a pupil is considered proficient in the first sighting and aiming exercise, he is put through the second and third sighting and aiming exercises by the instructor. Such pupils are then placed in pairs to instruct each other in these two exercises by the coach-and-pupil method.

FRONT SIGHT



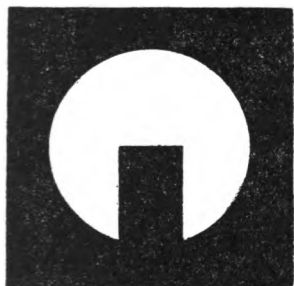
PEEP SIGHT

OPEN SIGHT



①

①



②

②



③

③

FIGURE 6.—Sight alinement.

17. Second sighting and aiming exercise.—*a.* A rifle with sights blackened is placed in a rifle rest and pointed at a blank sheet of paper mounted on a box (fig. 7). Without touching rifle or rifle rest, the coach takes the position illustrated and looks through the sights. The coach directs the marker by command or improvised signal to move the small disk until the bottom of the bull's-eye is in correct alinement with the sights (fig. 6 ③, ⑥) and then commands: **HOLD**, to the marker. The coach moves away from the rifle and directs the pupil to look through the sights in order to observe the correct aim.



FIGURE 7.—Position for second sighting and aiming exercise.

b. The marker moves the disk out of alinement. The pupil takes position and directs the marker to move the disk until the bottom of the bull's-eye is in correct alinement with the sights. The coach then looks through the sights to see if the alinement is correct.

c. The coach alines the sights on the bull's-eye with various slight errors to determine whether or not the pupil can detect them.

18. Third sighting and aiming exercise.—*a.* The object of this exercise is to show the importance of uniform and correct aiming, and to instill into the mind a sense of exactness. At 50 feet and with a small bull's-eye a man should be able to place all

three marks so that they could be covered by the unsharpened end of a lead pencil (fig. 7).

b. This exercise is conducted as follows: The rifle with the sights blackened is placed in a rifle rest and pointed at a blank sheet of paper mounted on a box. The pupil takes the position illustrated and looks through the sights without touching the rifle or rifle rest. The pupil directs the marker, by command or improvised signal, to move the disk until the bottom of the bull's-eye is in correct alinement with the sights, and then commands: **HOLD**, to the marker. The coach then looks through



FIGURE 8.—Position for third sighting and aiming exercise on long ranges.

the sights to see if the alinement is correct. Then without saying anything to the pupil, he commands: **MARK**, to the marker. The marker, without moving the disk, makes a dot on the paper with a sharp-pointed pencil inserted through the hole in the center of the bull's-eye. The marker then moves the disk to change the alinement. The pupil and coach, without touching the rifle or rifle rest, repeat this operation until three dots, numbered 1, 2, 3, respectively, have been made. These dots then outline the shot group and the pupil's name is written under it. The size and shape of the shot group will be discussed and the errors pointed out. This exercise will be repeated until proficiency is attained.

c. This exercise should also be held, during the period of the preparatory training, at 200 yards on a 10-inch movable bull's-eye (fig. 8), and, if time permits, at 500 yards on a 20-inch movable bull's-eye. These long-range shot group exercises teach the men to aim accurately at a distant bull's-eye, the outlines of which are indistinct. If the exercise is properly handled, it helps greatly to sustain interest in the work. At 200 yards a man should be able to make a shot group that can be covered with a silver dollar, and at 500 yards a shot group which is not over 2 inches in diameter.

d. Tissue paper will be used to copy off each pupil's shot group at long range. The name of the pupil will be written on the tissue paper under the shot group he made. These tracings are sent back to the firing line so that the pupil can see what he has done. The squad leader will turn over all shot groups to the platoon leader for his inspection.

e. The sighting and aiming exercises, especially the 200-yard shot group work, will be carried on during the time devoted to the second and third steps. The purpose of continuing these exercises is to bring backward men up to the proper state of proficiency and to assist in keeping the men interested.

f. Competition between the individuals of a squad to see which can make the smallest shot group is of value in creating interest in this exercise.

SECTION VII

SECOND STEP; POSITIONS

19. **Instruction in position.**—Correct position is of great importance in teaching men to shoot. Instruction in position involves blackening the sights, use of the gun sling, taking up the slack, the correct manner of holding the breath, aiming, and the use of the aiming device.

a. *Blackening the sights.*—In all preparatory exercises involving aiming, and in all range firing, both sights of the rifle will be blackened. The blackening is done by holding each sight for a few seconds in the point of a small flame which is of such a

nature that a smooth uniform coating of lampblack will be deposited on the metal. There are a number of materials which give a flame of the right nature for this purpose. Among the most commonly used are a candle, a piece of camphor, a wax match, a piece of pine wood full of pitch, a small piece of shoe paste, a rag saturated with any kind of oil. Some device must be provided to protect the flame from the wind.

b. Gun sling.—(1) The gun sling is of great assistance in shooting. It helps to steady the rifle, presses the butt of the rifle against the shoulder with the same amount of force for each shot, and reduces the effect of the recoil.

(2) Each man will be assisted by the instructor in adjusting his sling, which will be habitually carried with this adjustment. The gun sling will be tightened by means of the lower loop for drill or parade purposes without changing the adjustment of the upper loop. In a firing position the sling should be as tight as it can be made and still allow the man to get into it readily. A properly adjusted sling will feel uncomfortable until the muscles of the arm become accustomed to the pressure.

(3) There are two authorized methods of adjusting the sling; the *loop* adjustment and the *hasty sling* adjustment. The *hasty sling* is more rapidly adjusted than the *loop sling*, but it gives less support in positions other than the standing position. Instruction will be given in both sling adjustments.

(a) *Loop adjustment* (fig. 9).

1. Loosen lower loop.
2. Put left arm through upper loop from right to left, so that the upper loop is near the shoulder and well above the biceps muscle.
3. Pull leather keeper down so that it will hold the upper loop in place.
4. Move the left hand over the top of the gun sling and grasp the rifle near the lower band swivel so as to cause the sling to lie smoothly along the hand and wrist. Lower loop, not used in this adjustment, will be so loose as to prevent any pull upon it.

(b) *Hasty sling adjustment* (fig. 10).

1. Loosen lower loop.
2. Grasp the rifle just in rear of the lower band swivel with the left hand and grasp the small of the stock with the right hand.

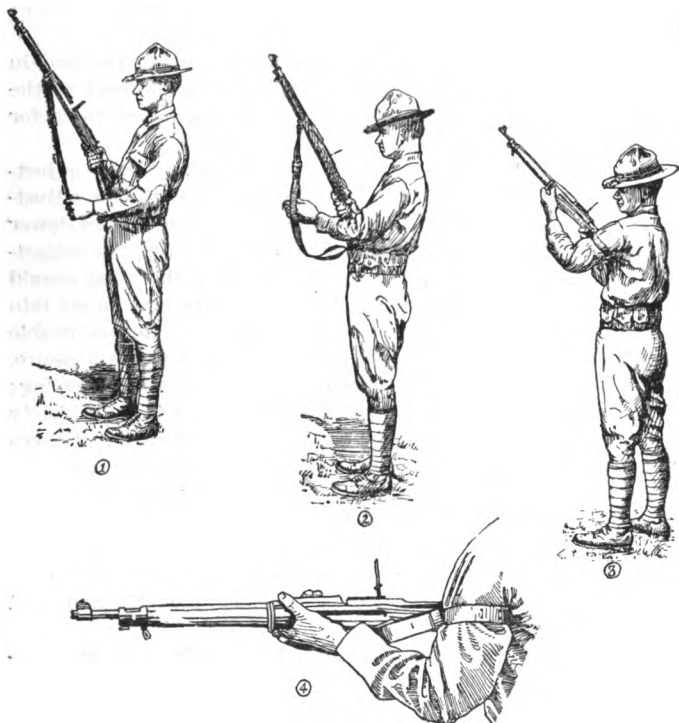


FIGURE 9.—Loop adjustment of the sling.

3. Throw the sling to the left and catch it above the elbow and high on the arm.
4. Remove the left hand from the rifle, pass the left hand under the sling, then over the sling and regrasp the

rifle with the left hand so as to cause the sling to lie along the hand and wrist. The sling may be given one-half turn to the left and then adjusted. This twisting causes the sling to lie smoothly along the hand and wrist.

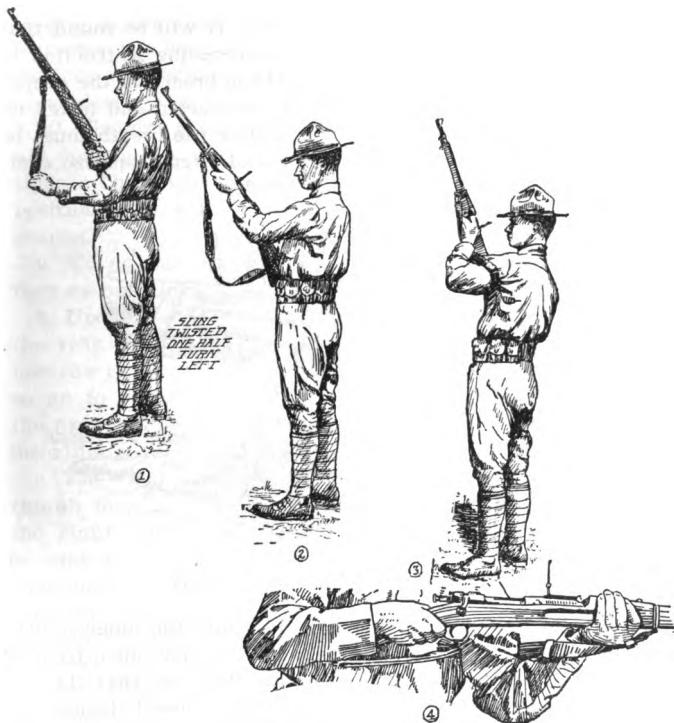


FIGURE 10.—Hasty sling adjustment.

c. Taking up the slack.—The slack is the first movement of the trigger which takes place when light pressure is applied. Taking up the slack is part of the position exercise because this play must be taken up by the finger as soon as the correct

position is assumed and before careful aiming is commenced. The entire amount of slack in the trigger is taken up by one firm pressure of the finger; if it is taken up by a slow gradual pressure the pupil cannot know when the entire amount has been taken up.

d. Holding the breath.—(1) Holding the breath in the proper manner while aiming is very important. It will be found that a large portion of men in any group undergoing instruction in rifle practice do not know how to hold the breath in the proper manner. Each man must be carefully instructed and tested on this point. The correct manner of holding the breath must be practiced at all times during position and trigger-squeeze exercises and whenever firing or simulating fire.

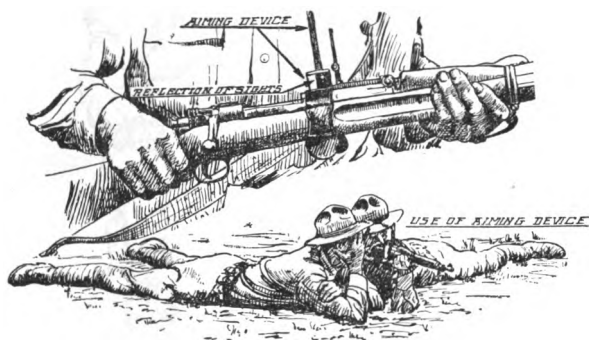


FIGURE 11.—Use of aiming device.

(2) To hold the breath properly draw into the lungs a little more air than is used in an ordinary breath. Let out a little of this air and stop the rest by closing the throat so that the rest of the air in the lungs will press against the closed throat. Do not hold the breath with the throat open or by the muscular action of the diaphragm as if attempting to draw in more air. The important point is to be comfortable and steady while aiming and squeezing the trigger.

e. Use of the aiming device (fig. 11).—This device will be used freely in the preparatory position, the trigger-squeeze exercises,

and gallery practice, so as to instruct the men in aiming and to correct errors. The device is a great help to the instructor in teaching men to shoot, both in preparatory work and in range practice. It is principally used in the position and trigger-squeeze exercises in the preparatory period. It cannot be used to advantage on the range when there is a poor light on the target. It can always be used to good advantage in the preparatory exercises because the small aiming bull's-eye is so close that outlines are distinct and the target can always be so placed as to be clearly seen.

20. General rules for positions.—The following general rules are common to the prone, sitting, kneeling, and standing positions. They will be considered a part of each paragraph on positions and will be referred to when studying those paragraphs.

a. To assume any position, first half face to the right and then assume the position.

b. Upon assuming any position there is some point to which the rifle points naturally and without effort. If this point is not the center of the target, the whole body must be shifted so as to bring the target into proper alinement. Otherwise, the firer will be firing under a strain because he will be pulling the rifle on the target by muscular effort for each shot.

c. The right hand grasps the small of the stock. The right thumb may be either around the small of the stock or along the right side of the stock. The position of the thumb will be such as to prevent injury to the face in firing. Most riflemen place the thumb along the right side of the stock.

d. The left hand is against or near the lower band swivel, the rifle resting in the palm of the left hand.

e. The left elbow will be as nearly under the rifle as it can be placed without appreciable effort.

f. The trigger should ordinarily be squeezed with the second joint of the index finger. The first joint may be used by men the length of whose arm or the size of whose hand is such as to make it difficult to reach the trigger with the second joint, or to whom the first joint of the finger seems more natural and comfortable.

g. The cheek is always pressed firmly against the stock and placed as far forward as possible without straining. It is desirable to have the eye as near as possible to the rear sight.

h. Left-handed men should be trained to shoot in the right-hand position. If this change is found to produce poor results in the case of any man, he will be allowed to shoot in the left-hand position. But he must be given additional preparatory rapid-fire practice to attain rapidity in working the bolt.

i. Men who cannot close the left eye may shoot in the left-hand position, but in practically all cases of this kind the man



FIGURE 12.—Prone position.

can, by practice, acquire the ability to close the left eye or to shoot with both eyes open.

21. Prone position (fig. 12).—*a.* Body lying at an angle of 45° to the line of aim with the spine straight; legs well apart; inside of the feet flat on the ground, or as nearly so as is possible without strain; elbows well under the body so as to raise the chest off the ground; right hand grasping the small of the stock; left hand near the lower band swivel, the rifle resting on the palm of the hand; cheek pressed firmly against the stock with the eye as near the cocking piece as it can be placed without straining; gun sling properly adjusted and tight enough to give firm support.

b. The elbows should not be unduly spread apart because such separation results in an unsteady position and brings the chest so near the ground that the neck has to be strained backward in order to see through the sights. This strained position of the neck interferes with good vision and tends to make the firer unsteady. The exact angle of the arms to the ground will depend somewhat upon the conformation of the man. The right elbow should be so placed that the right upper arm will not form an angle of less than 45° with the ground.

c. The exact position of the left hand will depend on the length of arm and width of chest of the individual. It should be as near the lower band swivel as the conformation of the man will permit. The left hand will never be placed against, or near, the trigger guard.

d. A tight gun sling will feel uncomfortable until the muscles of the arm have become accustomed to the pressure. When the gun sling is properly adjusted it is necessary to raise the right elbow from the ground in order readily to place the butt of the rifle against the shoulder.

22. Sandbag rest position (fig. 13).—a. The sandbag rest position conforms in every detail to the normal prone position described in paragraph 21, with the addition of a sandbag which supports the left forearm, wrist, and hand.

b. The bag is a little more than half full and tied near the top, so as to leave considerable free space above the sand.

c. It is important that the sandbag be high enough to permit the taking of the normal prone position. The natural tendency is to have a low rest and to be very flat on the ground with the elbows spread apart. This is a faulty position which causes lower scores than if no rest at all were used. The sandbag when properly adjusted is a great help. When it is not properly adjusted it is a handicap.

d. The sandbag rest position is used in the first stages of a pupil's training, not to teach steadiness of holding but to teach the correct trigger squeeze. By using the sandbag the slight unsteadiness of the hold is avoided and the temptation to try to snap in the shot at the instant the sights touch the bull's-eye, an action which causes all poor shooting, is eliminated.

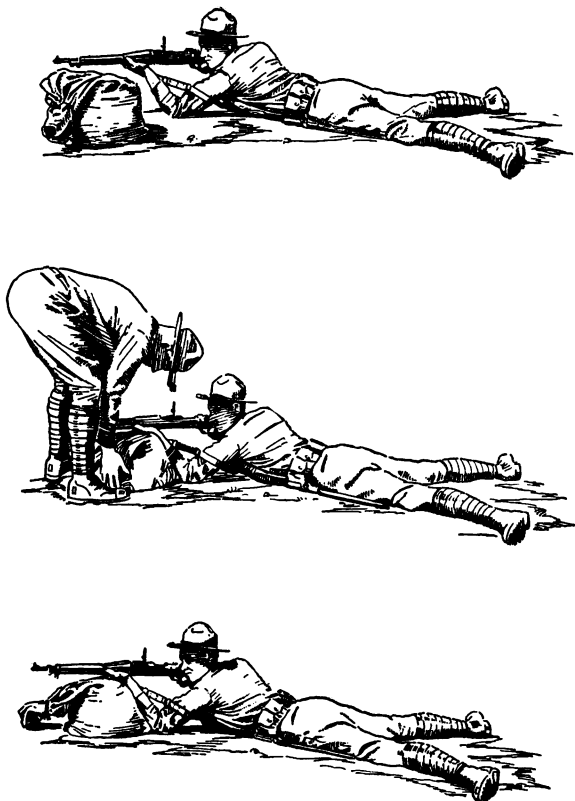


FIGURE 13.—Prone position with sandbag rest.

e. The coach will adjust the sandbag as follows:

(1) Have the pupil assume the prone position and aim at the target.

(2) Set the sandbag on its bottom and arrange the sand so that it is slightly higher than the back of the pupil's left hand.

(3) Facing the pupil, straddle the rifle barrel, and slide the sandbag against the pupil's left forearm, so that the narrow side of the bag supports his forearm and wrist and the back of his hand rests on top.

(4) Lower the sandbag to the proper height by pounding it with the hand.

23. Sitting position (fig. 14).—*a.* The firer sits half-faced to the right; feet well apart and well braced on the heels, which are dug slightly into the ground; body leaning well forward; both arms resting inside the legs and well braced; cheek pressed firmly against the stock and placed as far forward as possible without straining; left hand near the lower band swivel, the rifle resting on the palm of the hand.

b. The sitting position is used in the field when firing from ground that slopes downward to the front. In practicing this position the feet may be slightly lower than the ground upon which the pupil sits. Sitting on a low sandbag is authorized.

c. In the event the conformation of a man is such that he cannot assume the prescribed normal position, such changes as may be necessary to secure a steady comfortable position are authorized.

24. Kneeling position (fig. 15).—The firer kneels half-faced to the right on the right knee, sitting on the right heel; the left knee bent so that the left lower leg is vertical; left arm well under the rifle and resting on the left knee with the point of the elbow beyond the kneecap; right elbow approximately at the height of the shoulder; cheek pressed firmly against the stock and placed as far forward as possible without strain. Sitting on the side of the foot instead of the heel is authorized.

25. Standing position (fig. 16).—The firer stands half-faced to the right; feet from 1 foot to 2 feet apart; body erect and well balanced; left elbow well under the rifle; rifle resting on the palm of the left hand which grasps the piece in front of

the balance; butt of the piece high up on the shoulder and firmly held; right elbow approximately at the height of the shoulder; cheek pressed against the stock and placed as far



FIGURE 14.—Sitting position.

forward as possible without strain. A position with the left hand against or under the trigger guard and with the left upper arm supported against the body is not a practical field position and is prohibited.

26. Positions in standing trench.—These positions will vary according to the style of trench and build of the man. In general, it is a good plan to have as many points of support for the body and arms as possible. In a trench that has no berm for the left elbow, the position is the normal standing position.

The left hand is placed against the top of the parapet, and the rifle, just beyond the hand, rests on the parapet. With the berm the position is about the same, except that the left elbow



FIGURE 15.—Kneeling position.

rests on the berm. When the berm is wide enough, as it often is, both elbows can be rested on it, in which case the position of the upper part of the body is about the same as in the prone

position with the sandbag rest. In all positions in a trench the soldier should lean well against the butt of the rifle to insure firmness and steadiness.

27. Position exercises.—a. General.—Instruction in positions is the second step in the preparatory training and is conducted as follows:



FIGURE 16.—Standing position.

(1) The instructor assembles his squad or group, shows them the proper method of blackening the front and rear sights of the rifle, and has each pupil blacken his sights.

(2) The instructor explains and demonstrates the hasty sling adjustment and assists each pupil to adjust his sling. He explains the loop sling adjustment and assists each pupil to adjust his sling.

(3) The instructor explains and demonstrates the proper manner of taking up the slack and has each pupil practice it.

(4) The instructor explains and demonstrates the proper manner of holding the breath and has each pupil practice it.

(5) The instructor explains and demonstrates the use of the aiming device.

(6) The instructor explains the general rules which apply to to all positions.

(7) The instructor explains and demonstrates the prone position, prone position with sandbag rest, sitting, kneeling, and standing positions. He has each pupil assume each of these positions and corrects any errors that exist.

(8) The above points having been shown to the assembled group, the instruction becomes individual by the coach-and-pupil method supervised by the instructor. Small aiming bull's-eyes are used for this instruction. These bull's-eyes must be placed at different heights so that in aiming from the various positions the rifle will be horizontal.

b. Duties of the coach.—In the position exercises the coach sees that—

(1) The sights are blackened.

(2) The gun sling is properly adjusted, is tight enough to give support, and is high up on the arm.

(3) The proper position is taken.

(4) The slack is taken up promptly.

(5) The aim is correct.

(6) The breath is held while aiming. As soon as the aim becomes unsteady the exercises cease and after a short rest are repeated. The coach checks the pupil's aim occasionally by means of the aiming device, and the pupil's manner of holding his breath by watching his back. The trigger is not squeezed in the position exercises.

28. Assuming prone position rapidly.—*a. Skirmishers' method* (fig. 17).—(1) The movement is described by the numbers for the purpose of instruction in the sequence of movement. After this sequence is learned the position will be taken as one motion. With practice men can take the prone position and be aiming at the target in 3 seconds.

(a) Being at the *Ready*, sling adjusted, points selected at which right and left elbows are to rest when in the prone posi-

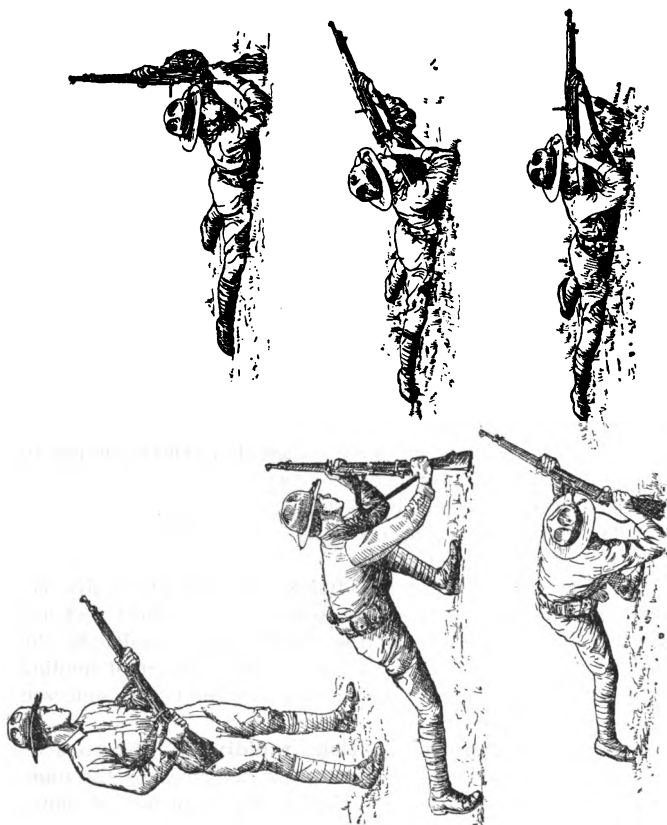


FIGURE 17.—Assuming the prone position.

tion, throw the right foot well back and bend left knee as low as possible, placing the butt of the rifle on the ground 4 or 5 inches to the left, and slightly in front of the spot where the right elbow is to rest. The grip on the rifle is retained with both hands.

(b) Place the right elbow on the ground.

(c) Place the left leg back near the right one, feet apart, and slide well back while lying on the belly.

(d) Take the butt of the rifle off the ground and place it against the right shoulder.

(e) Lower the left elbow to the ground.

(2) These movements will bring the firer into his normal position with the rifle pointing at the target. Care should be taken to place the butt of the rifle on the ground without jar and to place the elbows on the ground in the same manner. With practice this position can be assumed very rapidly and without shock.

(3) When the details of this movement have been learned it should be practiced as one movement. When properly done the feet will still be sliding into position when the rifle is being placed on the shoulder, and the left elbow will come to the ground at almost the same time that the backward movement of the body is completed.

b. Alternate method (fig. 18).—The movement is described by the numbers for the purpose of instruction in the sequence of the movement. After this sequence is learned the position will be taken as one motion.

(1) Being at the *Ready*, sling adjusted, points selected at which right and left elbows are to rest when in the prone position, and the point on the ground just below the butt of the rifle when in the firing position marked, the rifle grasped with the left hand just below the lower band and the right hand at the heel of the stock, bend both knees to the ground.

(2) Place the butt of the rifle on the ground at the point marked.

(3) Place the left elbow on the ground.

(4) Place the butt of the rifle against the right shoulder with the right hand, at the same time spreading the feet apart.

(5) Grasp the small of the stock with the right hand and place the right elbow on the ground.

c. *After a run from a prone position.*—(1) Being in the prone position as shown in plate 3, TR 420-85, with the rifle loaded and locked and with sight leaf laid down.

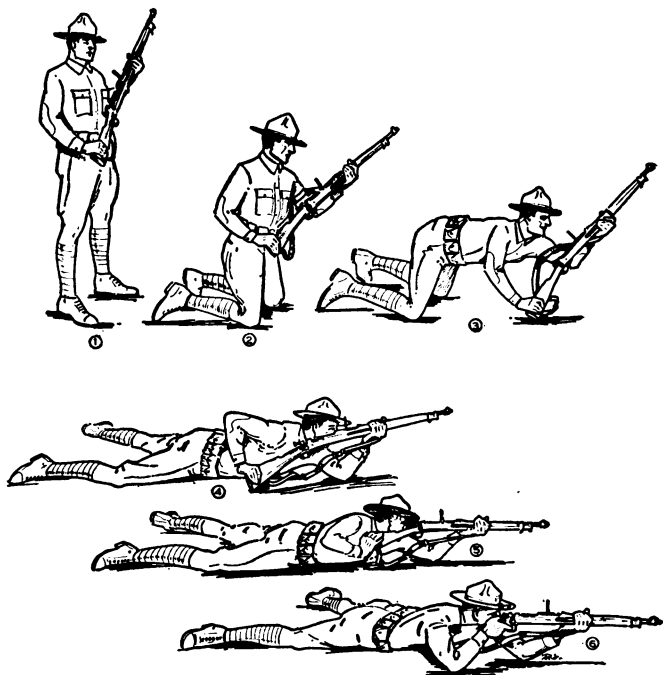


FIGURE 18.—Alternate method of assuming the prone position.

(2) Rise and move forward at a run as described in paragraph 12e, TR 420-85, at the command: 1. *Prepare to rush*, 2. *UP*.

(3) *Upon arrival at the firing point* (fig. 19).—(a) Advance the left foot, turning it across the front of the body.

(b) Drop forward on the outside of the left knee and at the same time extend the rifle, grasped in both hands and held vertically, so that the butt strikes the ground at full arm's length directly in front of the left knee.

(c) Pivoting on the left knee and the butt of the rifle, roll forward on the right elbow and right side.

(d) Throw the sling to the left and catch it above the elbow and high on the arm. Remove the left hand from the rifle, pass the left hand under the sling and then over the sling, and regrab the rifle just below the lower band with the left hand. Place the left elbow on the ground.

(e) With the right hand, raise the sight leaf, unlock the piece, and place the butt of the rifle against the right shoulder.

(f) Grasp the small of the stock with the right hand and place the right elbow on the ground.

d. The ability to assume this position rapidly is a distinct advantage in war because a man can thus fire an aimed shot more quickly than if he remained standing. The position also reduces the enemy's target from a standing to a prone figure. Instruction in taking positions rapidly will be given during the period of preparatory training.

e. Other methods of assuming the prone position from standing and from a run may be used.

29. Assuming sitting position rapidly.—a. To assume the sitting position rapidly, break the fall by placing the right hand on the ground slightly to the right rear of the spot on which to sit.

b. In practicing for range firing, first sit down and aim at the target in the normal sitting position. Then mark the position of the heels and the spot on which to sit. Then at the command, **Ready on the firing line**, stand with the heels in the places made for them. As the target appears, sit down on the spot marked, breaking the fall with the right hand, regrab the small of the stock with the right hand, and assume the aiming position.

c. Other methods of assuming the sitting position may be used.

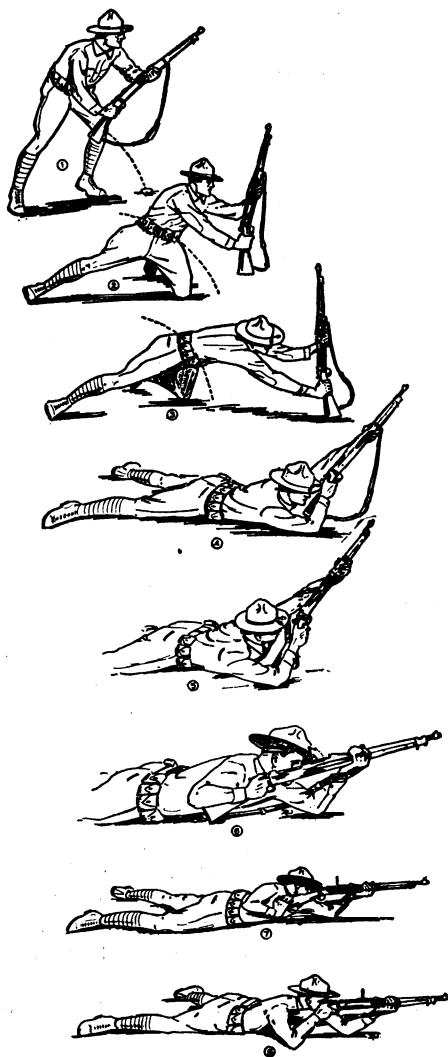


FIGURE 19.—Assuming the prone position upon arrival at the firing point.

SECTION VIII

THIRD STEP ; TRIGGER SQUEEZE

30. Importance of trigger squeeze.—*a.* The most important item in rifle shooting is to squeeze the trigger in such a way as to fire the rifle without affecting the aim. The trigger must be squeezed so steadily that the firer cannot know the instant the piece will be fired. Any man can hold the rifle steady enough to fire a good shot, and he can so hold it for a comparatively long time. Misses and poor shots are due to spoiling the aim just before the discharge takes place. This is done by jerking the trigger and flinching. If a man squeezes the trigger so steadily that he cannot know when the discharge will take place, he does not spoil his aim and he will not flinch, because he does not know when to flinch.

b. No good shot attempts to set the rifle off at any instant at which his sights are alined on the mark. He holds his aim as accurately alined on the mark as possible and maintains a steady pressure upon the trigger until the piece is fired. This method of squeezing the trigger must be carried out in all preparatory practice or the whole value of the practice is lost.

c. There is only one correct method of squeezing the trigger; a steady increase of pressure so that the firer does not know when the discharge will take place.

d. Excellent shots are men who through training have learned to increase the pressure only when the sights are in absolute alinement with the bull's-eye. When the sights get slightly out of alinement, they hold what they have with the finger and only go on with the increase of pressure when the sights again become properly alined.

e. The difference between poor shots and good shots, good shots and very good shots, and very good shots and excellent shots is only the difference in their ability to squeeze the trigger properly. The heart and soul, the beginning and end of good shooting, is the trigger squeeze. Any man with fair eyesight and strength enough to be on duty can aline the sights on the target and hold them there for an appreciable length of

time. When he has acquired sufficient will power and self-control to forget that there is to be an explosion and a shock, and squeezes the trigger with a steady increase of pressure until the rifle is fired, he has become a good shot, and not until then. This squeeze of the trigger applies to rapid fire as well as slow fire. The increase of pressure is faster in rapid fire, but the process is the same.

31. Calling the shot.—The pupil must always notice where the sights are pointed at the instant the rifle is fired, and call out at once where he thinks the bullet will hit. Shots are called even when only simulating fire at a mark, so as to acquire the habit and to develop a closer hold. No man can become a good shot until he is able to call his shot before it is marked. Inability to call a shot indicates the firer did not know where the sights were pointing at the time the rifle was fired; in other words, he shut his eyes first and fired afterward.

32. Trigger-squeeze exercise.—*a. General.*—(1) The instructor explains to the assembled squad or group the importance of correct trigger squeeze (par. 30). He assures himself by questions that each pupil understands what is meant by a "steady increase of pressure"; that is, that the increase is only applied when the aim is correct and then by a steady increase and not by a sudden pressure. The instructor explains the necessity for calling the shot (par. 31). The above points having been explained the instruction becomes individual by the coach-and-pupil method supervised by the instructor.

(2) The pupil is first taught the trigger squeeze in the prone position with the sandbag rest. In this position he can hold steadily and has not the temptation to "snap" the shot the instant the front sight touches the bull's-eye, as he has in a less steady position. After he has learned the principles of correct trigger squeeze with the sandbag rest, he is instructed in the other positions, but for the first half day at least he is not allowed to squeeze the trigger except in the prone position, first with, and then without, the sandbag rest.

(3) A great deal of trigger-squeeze exercise is necessary, but it must be carefully watched and coached. Trigger-squeeze exercise that is not along the right lines is worse than none.

(4) Soldiers will not be allowed to simulate fire until they have been thoroughly instructed in trigger squeeze, and then in all drills and field exercises where fire is simulated they will be cautioned to aim at definite objects and to carry out the correct principles of aiming, squeezing the trigger, and calling the shot. Careless trigger squeezing in field exercises may injure a soldier's chance of becoming a good shot.

b. Duties of the coach.—In the trigger-squeeze exercises the coach sees that—

- (1) The sights are blackened.
- (2) The gun sling is properly adjusted, is tight enough to give support, and is high up on the arm.
- (3) The proper position is taken.
- (4) The slack is taken up promptly.
- (5) The aim is correct. He occasionally checks the aim by means of the aiming device.
- (6) The breath is held while aiming. He checks the breathing by watching the back of the pupil under instruction.
- (7) The trigger is squeezed properly (only when the aim is correct and then only by a steady pressure).
- (8) The pupil calls the shot.

SECTION IX

FOURTH STEP ; RAPID FIRE

33. General principles.—*a.* All the points learned in slow fire are carried out in rapid fire. It is especially important that the men understand that the trigger squeeze is the same as in slow fire. Time is gained by reloading the magazine quickly and without fumbling, by working the bolt rapidly, and by keeping the eye on the target while working the bolt.

b. The importance of correct rapid-fire training cannot be too strongly emphasized. This is a phase of instruction that is often neglected. Rapid fire does not mean that accuracy is sacrificed for rapidity. Through training, accurate fire becomes more and more rapid until the ability to fire from 10 to 15 accurate shots per minute is acquired, but no man will be permitted to attempt

to fire more than 10 shots per minute until he has had long training on the rifle range and has become a seasoned shot. Recruits having target practice for the first time will not be admonished for failing to fire the prescribed number of rounds in the stated time limit. It is advisable to extend the time 10 or 15 seconds for recruits when they first begin rapid-fire practice on the range.

c. Careful coaching is essential to prevent acquiring the habit of looking into the chamber while working the bolt. The man who looks into the chamber works the bolt slowly, so as to see the cartridge run in. He loses time in finding his own target again. He often fires on the wrong target. The application in war is apparent; a soldier who takes his eye off an indistinct target to look into the chamber while working the bolt may not be able to find his target again.

d. Training for rapid fire extends throughout the year. This training is accomplished by requiring all simulation of fire during problems and maneuvers to be carried out along the proper lines.

e. Rapid-fire exercises are given under conditions conforming as nearly as possible to those of actual range practice. Full-sized targets are placed at 200 and 300 yards from the men under instruction, with some simple arrangement permitting the target to be exposed to view for the prescribed period of time.

f. A curtain of target cloth or other material may be arranged on each target frame in such a way that it can be dropped to expose the face of the target and pulled up again to conceal it. A cord which runs over the top of the target frame may be used for this purpose.

g. When lack of time, material, or space makes it absolutely necessary, the rapid-fire exercises may be held at shorter ranges and on targets proportionately reduced in size. This practice as well as all other preparatory exercises can be held indoors when weather conditions make it necessary.

34. Bolt-operation exercise.—*a. General.*—(1) This exercise is held for the purpose of acquiring a smooth and rapid bolt operation. The trigger is not pressed, but is tied back to the trigger guard in order to cause the bolt action to be the same as

it is when the trigger has been pressed. If the trigger is not thus tied, the piece will remain cocked when the bolt is shoved home, and the amount of force necessary to raise the bolt again will be less than when actually firing or simulating fire.

(2) Practice in bolt-operation exercise will be held in all positions and no pupil will be considered proficient until he can operate the bolt at least 20 times in 20 seconds while in the prone position. The first hour of rapid-fire training will be devoted to bolt-operation exercises. Thereafter each pupil will be given additional practice from time to time until he is considered proficient.

(3) The bolt-operation exercise is conducted as follows:

(a) The instructor places his squad or group in line, has each man tie the trigger to the back of the trigger guard, and explains why this is done.

(b) The instructor explains and demonstrates that the bolt is jerked fully back and slammed home with practically one motion, instead of by four distinct motions as men are inclined to do at first.

(c) The instructor demonstrates the bolt-operation exercise, emphasizing the duties of the coach as outlined in *b* below.

(d) The above points having been explained, the instructor places his squad or group in line, arranged in pairs to act as coach and pupil, requires the pupils to assume a firing position, and personally gives the commands for starting and stopping the exercise. Frequent changes of coach and pupil are necessary to prevent undue fatigue.

b. Duties of the coach.—In the bolt-operation exercise the coach sees that—

(1) The bolt is operated properly and rapidly.

(2) The eye is kept on the target.

(3) The right hand is brought to the small of the stock, the rifle to a horizontal position, and the cheek placed against the stock each time the bolt is closed.

(4) The butt of the rifle is kept against the shoulder.

(5) The elbows are kept on the ground if in the prone position, or between the legs if in the sitting position.

(6) No attempt is made to aim or press the trigger.

35. Rapid-fire exercise.—a. General.—(1) The instructor assembles his squad or group and explains and demonstrates—

(a) The correct method of loading a clip of ammunition into the magazine, using dummy cartridges for the demonstration. He explains that the ball of the right thumb is placed on the powder space of the upper cartridge very close to the clip, with the fingers under the rifle against the floor plate, the cartridges being shoved into the magazine with a firm steady push. The empty clip is removed with the right hand.

(b) The working of the bolt while in the prone position, keeping both elbows on the ground and allowing the muzzle to drop down and to the right. The working of the bolt in the sitting position, keeping both elbows between the legs and allowing the muzzle to drop down and to the right.

(c) The disadvantage of looking into the chamber while working the bolt and of looking into the magazine to see if there are any more cartridges left.

(d) That the follower holds the bolt back when the magazine is empty and that the eye is never taken from the target until the follower holds the bolt except when a man has counted the shots fired and knows that his magazine is empty.

(e) That the butt of the rifle is never taken from the shoulder when working the bolt.

(f) That a quiet, confident movement of the hand in taking the clip from the belt and placing it in the clip slot is really more rapid than a hurried movement, and avoids the chance of fumbling which usually accompanies hurried movements.

(2) The above points having been explained and demonstrated, the instructor places his squad or group in line and arranges them in pairs so that they may act as coach and pupil. The commands and procedure are exactly the same as in actual rapid fire on the rifle range except that practice dummy ammunition is used. Rapid-fire targets set at 200 and 300 yards from the line of pupils are exposed to view for the proper interval of time upon signals from the instructor in charge of the line. Sights are set at the actual range being used (par. 33 e).

(3) Practice dummy ammunition only will be used in this exercise. The use of range dummy ammunition except on the firing line is prohibited.

b. Duties of the coach.—In a rapid-fire exercise the coach sees that—

- (1) The sights are blackened.
- (2) The gun sling is properly adjusted.
- (3) The correct position is taken.
- (4) The slack is taken up promptly.
- (5) The breath is held while aiming.
- (6) The trigger is squeezed properly.
- (7) The bolt is worked rapidly.
- (8) The eye is kept on the target, the elbows kept in place, and the butt of the rifle kept to the shoulder while working the bolt.
- (9) The magazine is reloaded quickly and without fumbling.

SECTION X

EFFECT OF WIND; SIGHT CHANGES; USE OF SCORE BOOK

36. Wind.—*a.* With the exception of wind, weather conditions have practically no effect on the bullet up to 600 yards. Beyond 600 yards the effect is slight, but it is well for the expert shot to understand the influences of the different atmospheric conditions and the corrections to be applied. In firing at 600 yards or under, the effect of the weather conditions (except that of the wind) on the bullet can be disregarded. The influence of wind must be carefully studied.

b. The horizontal clock system is used in describing the direction of the wind. The firing point is considered the center of the clock and the target is at 12 o'clock. A 3 o'clock wind comes directly from the right. A 6 o'clock wind comes straight from the rear. A 9 o'clock wind comes directly from the left. A wind that is constantly changing its direction back and forth is called a *fishtail wind*.

c. The force of the wind is described in miles per hour. The force of the wind is estimated by throwing up light, dry grass,

dust, or light paper and watching how fast it travels, by observing the danger flags, and by the mirage. In general, a light breeze is a 5 to 8 mile wind; a fairly strong breeze is a 10 to 12 mile wind. Wind blowing 20 miles an hour is very strong.

d. Wind from either side blows the bullet out of its path. This must be allowed for by moving the rear sight toward the wind by means of the wind gage. The worst kind of a wind in which to shoot is a fishtail wind at 12 or 6 o'clock. The amount the bullet will be blown from its path depends on the force and direction of the wind and on the distance to the target.

e. The amount of windage to allow for the first shot is shown in the wind-gage diagram in the score book. It can be found approximately by applying the wind rule.

f. After the first shot is marked the correction necessary in windage is found by referring to the ruled targets in the score book showing the windage correction for each range. Windage corrections can also be estimated by applying the wind-gage rule given in paragraph 38.

37. Wind rule.—a. The range (expressed in hundreds of yards) multiplied by the velocity of the wind and divided by 10 equals the number of quarter points to allow for a 3 o'clock or 9 o'clock wind. (M1906 ammunition.)

Example: At 500 yards the wind is blowing 8 miles per hour at 3 o'clock, $\frac{5 \times 8}{10}$ equals 4 quarter points or 1 point of windage. The sight should have 1 point of right windage for the first shot.

b. As the direction of the wind gets nearer and nearer to 12 or 6 o'clock the amount of windage necessary becomes less and less. Winds 1 hour away from 3 and 9 o'clock require only slightly less windage. Winds 1 hour away from 12 and 6 o'clock require almost half as much windage as 3 or 9 o'clock winds.

c. Winds that are at 12 o'clock require no windage, but it is a very rare thing to have a steady wind from either 12 or 6 o'clock. Strong winds from 12 o'clock tend to retard the bullet a little, and from 6 o'clock tend to accelerate the bullet, but the amount is so slight that a correction in elevation is very seldom necessary. At the most this allowance is very small.

38. Wind-gage rule.—*a.* One point of windage moves the point of impact of the bullet 4 inches for each 100 yards of range. Thus 1 point of windage will move the hits 8 inches at 200 yards, 12 inches at 300 yards, and 20 inches at 500 yards. This rule is not exact, but near enough for all practical purposes.

b. The point of impact of the bullet will move in the same direction as the rear sight is moved. For example, if it is desired to move the hits to the left, the rear sight must be moved to the left; if it is desired to make the hits strike lower and to the right, the rear sight must be moved down and to the right.

39. Mirage.—*a.* Heat waves that can be seen near the ground are called *mirage*. The direction in which these waves are blowing and their speed are watched by good riflemen in judging the direction and velocity of the wind. The mirage is of assistance in judging the wind principally on bright days when there is a light, variable breeze.

b. In a moderate wind the waves seem to race across the range and to lie close to the ground. In a light wind the waves do not lie so close to the ground and appear to move more slowly. In strong winds the mirage cannot be seen.

c. When there is no wind or when the wind is at 12 or 6 o'clock the mirage seems to boil. The "boiling" of the mirage signifies that the wind is changing direction. The firer should wait until the mirage begins a steady flow from one side or the other before firing.

d. Mirage can be seen much better with a field glass or telescope than with the eye alone.

40. Elevation rule.—*a.* Changing the elevation 100 yards at any range (M1906 ammunition) will give a change on the target, in inches, equal to the square of the range (expressed in hundreds of yards).

Example: At 200 yards, changing the elevation 100 yards makes 4 inches change on the target; at 300 yards, 9 inches; at 500 yards, 25 inches; at 600 yards, 36 inches. This rule is not exact, but near enough for all practical purposes.

b. The horizontal lines in the model targets in the score book also show how much change to make in the elevation at each range. When a change in elevation is necessary it is best to

consult the model target in the score book before deciding how much of a change to make.

41. Light.—*a.* Light has no effect on the bullet but does affect the aim. The effect of changes of light is very slight with most riflemen. The correction for variations in light does not exceed 25 yards in elevation at any range. The effect of changes of light is not uniform in its effect upon the aim of all riflemen.

b. As a general rule men unconsciously aim a little lower in a poor light than in good light, and consequently need more elevation when the light is poor. This lowering of the aim is due to the fact that the outline of the bull's-eye is not distinct in a poor light; therefore men cannot hold as close to the bull's-eye and still be sure of their aim. As a rule poor lights exist on dark days when there is a haze in the air; on very bright, warm days, when there is a decided mirage; and when the sun is back of the target. The best light for shooting is when the sky is uniformly overcast and there is sufficient light to see the target clearly.

c. Sunlight from one side has the same effect with most men as wind from that side. This is because the side of the front sight toward the sun is more clearly defined and unconsciously held under the center of the bull's-eye. Such holding places the bullet on the opposite side of the bull's-eye from the sun. The allowance of windage for sunlight varies from zero to almost one-half a point. In making this allowance the sight is moved toward the sun.

42. Zero of a rifle.—*a.* The zero of a rifle for each range is the point at which the rear sight must be placed for both elevation and windage, in order to hit the center of the bull's-eye on a normal day when there is no wind. This zero may not conform to the marks on the sight leaf and the wind gage. The zero of any one rifle may differ with different men, owing to the difference in their way of holding the rifle or of aiming.

b. Each man must determine the zero of his own rifle for each range. He does this by studying the data which he has written in his score book concerning sight settings, sight changes, light, and the direction and velocity of the wind. The

zero of a rifle is best ascertained on a day with an overcast sky when there is no wind. Having learned the zero of his rifle the rifleman computes all his windage and elevation allowances for the first shot from this zero and not from the zero marked on the rifle sight, unless the two correspond.

43. Canting the rifle.—If the rifle is canted, the bullet will not hit exactly where the rifle is aimed. Even unskilled shots, however, cant the rifle but very slightly, and the effect on the strike of the bullet is correspondingly slight. The mistake of ascribing a wide 4 or a 3 to a slight cant of the rifle should not be made.

44. Shooting up or down hill.—In shooting either up or down hill, less elevation is needed than when shooting on the level. The steeper the hill the less elevation is needed, so that when firing vertically up or down no elevation at all is needed, no matter how distant the target. Slight slopes that may be found on target ranges have no appreciable effect upon the model target.

45. Sight-setting and sight-changing exercises.—In these exercises the instructor uses the full-sized A, B, and D targets, with spotters to indicate the position of the hits.

a. The instructor assembles his squad or group, each pupil having his rifle, score book, and pencil and conducts the exercise as follows:

(1) Points out the wind gage and explains that each line or division represents one point of windage.

(2) Points out the graduations on the sight leaf and explains that the line directly under the number represents the range.

(3) Explains the effect of wind and cautions the class to disregard all atmospheric influences except wind.

(4) Explains the wind-gage diagram in the score book.

(5) Reads over and explains the wind rule, wind-gage rule, and the elevation rule. By asking questions he assures himself that these rules are understood.

(6) Explains the horizontal and vertical lines on the model targets in the score book and assures himself that each man understands the use of this diagram.

(7) Shows the pupils how to draw the elevation and windage lines for each range on the blank targets of the score book upon which they are to plot their shots during range firing.

(8) The above points having been explained to the assembled group, the pupils are placed in pairs. The instructor tests the ability of the members of the class to set the sights for the first shot by use of the wind rule or the wind-gage diagram. Every time the sights are set each pupil examines the sight of the pupil paired with him and tells the instructor, when called upon, the sight setting used.

(9) Instructor tests ability to change sights intelligently after first shot by referring to the horizontal and vertical lines on the model target.

b. Examples of sight-setting exercises:

(1) "You are at 500 yards and estimate the wind to be 10 miles at 3 o'clock; set your sights for the first shot. Jones, what does Smith's sight read? Robinson, what should the sight read? Each man whose teammate did not set his sight at $1\frac{1}{4}$ points right windage, hold up his hand." The instructor, by questions and explanations, assists the men who have made mistakes.

(2) "You are at 600 yards and estimate the wind to be 10 miles at 9 o'clock; set your sights for the first shot. Suppose you fired and the spotter marked the hit here (placing a spotter in the 4 space near the bull's-eye, at 3 o'clock) and you were sure your hold and trigger squeeze were good; change your sights to bring the next shot into the center of the bull's-eye. Johnson, what does William's sight read? Snider, what should the sight read? Each man whose teammate did not have his sight set at 2 points left windage, hold up his hand."

c. The instructor assists those men who have made decided errors. Differences of less than one-fourth point are matters of opinion in applying the rules and are unimportant.

d. The instructor gives a number of examples with the wind at different angles and velocities and at the various ranges until the class thoroughly understands the use of the wind gage.

e. Following the instruction in the use of the wind gage, the instructor puts the class through similar exercises which require changes in elevation.

f. The instructor gives a number of examples which require changes in both windage and elevation until the principles of sight changing are well understood by the class.

g. Assume the zero of the rifles to be away from the normal both as to windage and elevation and repeat the exercises.

h. Examples of other sight-setting exercises:

(1) "Set your sight at 625 yards with $1\frac{1}{2}$ points of left windage. Suppose you fire four shots hitting here (place four spotters in the bull's-eye), and your fifth shot goes here (place spotter on 3 space at 11 o'clock). Jones, what are you going to do now? Jenkins, what are you going to do? You should not do anything to the sight. It is practically certain that you squeezed the trigger improperly and flinched. Not even a very sudden and violent change in the weather or light could cause nearly that much of a difference. Don't try to correct your own faults by changing the sights around."

(2) "For your first score in rapid fire at 200 yards you have set your sight at the same elevation and windage that you used in slow fire. Suppose this to be 200 yards elevation and zero windage and your group goes here (putting 10 spotters low and to the left). Set your sight to bring the next score into the figure. Miller, what does Wright's sight read?"

i. A group in rapid fire should strike the same place as in slow fire. Rapid-fire groups that vary in position from slow-fire groups are due to imperfect trigger squeeze in rapid fire, and consequently these groups are more scattered. Men should endeavor to so squeeze the trigger that the rapid-fire sight settings will be the same. But if there is a constant variation in the two sight settings, each man should note it in his score book and set his sight in rapid fire so as to make the groups count as much as possible. Groups that are scattered all over the target cannot be corrected by changing the sight.

46. Use of the score book.—*a.* Each man must keep a score book in which he records not only the value of the hits but the location of each hit, the sight setting and sight changes, the

force and direction of the wind, the kind of light, the hour, the date, and such other data as may be of use in the future. Spaces for these notes are provided on the score sheets of the score book.

b. The use of the score book on the range is important for the following reasons:

(1) The plotting of the shots shows the firer the location of his group.

(2) The wind-gage diagram indicates the windage to take for the first shot. The model target shows by means of vertical and horizontal lines the change in elevation and windage necessary to place the group in the center of the target.

(3) Plotting the shots and recording the data as to light and wind help the soldier to learn the zero of his rifle.

(4) The data written down as to sight settings and weather conditions while firing at any range are of great assistance in setting the sight correctly when again firing at that range. Where a number of scores have been fired and recorded, the firer should get his sight settings from previous scores fired on days that were similar as to light and wind.

c. The score book will be kept personally by the man firing. The coach assists him when necessary to decide what to write down, but the coach will neither plot the shots nor enter any data.

47. Score-book exercises.—The squad or larger group is assembled in front of a full-sized B target, each man with score book, pencil, and rifle. The class is divided into pairs. Each man acts as coach for the other man of his pair.

a. The instructor states the light and weather conditions and the range. He then indicates 10 successive shots on the target by means of a spotter and requires each man to plot each shot as it is indicated, write down the data given from time to time, and make the actual sight settings and corrections on his rifle. Weather and light conditions assumed by the instructor and changes announced during the exercise should be such as are likely to occur on the rifle range.

b. The pupils are told by the instructor to open their score books at the first blank page and plot the shots and write in the

data as given to them. They are further instructed to write lightly so that erasures may be made allowing the same page to be reused. The example as given will be substantially as follows:

(1) "You are at 600 yards on the rifle range. You are getting ready to fire a slow-fire score. There is bright sunlight. The wind varies from 8 to 12 miles an hour in velocity and from 1 to 3 o'clock in direction. When you are in position ready to fire the first shot, the wind seems steady at 3 o'clock and blowing about 8 miles an hour. Write in your data and set your sights. Jones, where has Robinson set his sight? Williams, where has Smith set his sight? You should have a scant $1\frac{1}{4}$ points of right windage.

(2) "You fire your first shot and the spotter marks it here (put spotter a close 4 at 7 o'clock). Decide what you are going to do and set your sights. Dodd, what does McLean's sight read? You should have moved your sight about one-fourth a point to the right and raised it 25 yards so that your sight should read 625 yards and a scant $1\frac{1}{2}$ or a strong $1\frac{1}{4}$ of right windage.

(3) "Your second shot goes here (spotter near center of bull's-eye); your third shot goes here (spotter in bull's-eye near the top); your fourth shot goes here (spotter in bull's-eye near the bottom); your fifth shot goes here (close 4 at 9 o'clock). The wind seems to be a little stronger, but you are not sure. Your hold was all right. Johnson, what are you going to do?" "I would take half the correction called for by the model target." "Set your sight accordingly. You should have about $1\frac{3}{4}$ points of right windage now. Your sixth shot goes here (a bull's-eye near the edge at 3 o'clock). Malone, what are you going to do? The four on the fifth shot must have been due to an error in aim or trigger squeeze, so put your sight back to where it was before ($1\frac{1}{2}$ points).

(4) "Before you fire your seventh shot you notice that the wind has shifted to about 1 o'clock but still blowing the same rate. Wilson, where has Simpson set his sight now? Billings, what does the book say about a 1 o'clock wind? You need almost half as much windage as for a 3 o'clock wind. You

should now have almost $\frac{3}{4}$ point of right windage. Set your sight there.

(5) "Your next shot goes here (a wide 4 at 6 o'clock). Collins, what correction has Brown made for his eighth shot? You should have made no change in your sight. Your windage is apparently correct and there has been no change in the conditions. Your low shot was due to a poor aim or a poor trigger squeeze. Do not try to correct your personal errors by moving your sight around. Your eighth shot goes here (bull's-eye); your ninth shot here (bull's-eye); your tenth shot goes here (bull's-eye). Write in your notes and exchange books with your teammate. Smith, has Williams plotted all the shots correctly? Read the notes he has written in his book."

c. The instructor corrects errors and mistaken ideas and makes a note of the pupils needing additional instruction.

SECTION XI

FIFTH STEP; EXAMINATION OF MEN BEFORE STARTING RANGE PRACTICE

48. Examination.

NOTE.—The answers given herein are merely examples. Men should be required to explain them in their own words.

Q. What is this (drawing a circle on the ground or on paper)?
A. A circle.

Q. Where is the center of it? A. Here (pointing to the center).

Q. Suppose that circle represents a peep sight through which you are looking and that you are told to bring the top of the front sight to the center of it; where would the top of the front sight be? A. Here (pointing to the center of the circle).

Q. Make a mark in the circle to represent the front sight. Make a small circle to represent the bull's-eye. Is the bull's-eye in the center of the peep sight? A. No; the bottom edge of it is in the center.

Q. Why? A. Because the top of the front sight is in the center and just touches the bottom edge of the bull's-eye.

Q. Should the front sight be held up into the bottom of the bull's-eye? **A.** No; it just touches the bottom edge of the bull's-eye, so that all of the bull's-eye can still be clearly seen.

Q. What is this (indicating sighting bar)? **A.** Sighting bar.

Q. What is it for? **A.** To teach me how to aim.

Q. Why is it better than a rifle for this purpose? **A.** Because the sights on it are much larger and slight errors can be more easily seen and pointed out.

Q. What does this represent? **A.** The front sight.

Q. And this? **A.** The rear sight.

Q. What is this? **A.** The eyepiece.

Q. What is the eyepiece for? **A.** To cause me to place my eye in such a position as to see the sights in the same alinement as that set by the coach.

Q. Is there an eyepiece on the rifle? **A.** No; I learn by the sighting bar how the sights look when properly alined, and I must hold my head so as to see the sights the same way when aiming a rifle.

Q. How do you hold your head steadily in this position when aiming a rifle? **A.** By pressing my cheek firmly against the side of the stock.

Q. Where do you focus your eye when aiming a rifle? **A.** On the bull's-eye.

Q. Tell me what is wrong with these sights. (The instructor now adjusts the sights of the bar, making various slight errors; first, to show the correct and incorrect adjustments of the sights, and then, with the sights properly adjusted, he sights on the small bull's-eye to demonstrate correct and incorrect adjustments, requiring the man to point out any errors.)

Q. What is the difference between the way you aim with peep sight and the way you aim with an open sight? **A.** There is no difference. In both the top of the front sight is brought to the center of the circle. With the open sight the top half of the circle is omitted, making it look as if the top half of the circle had been cut off and removed.

Q. Now, take this sighting bar and adjust the sights properly. (Verified by the instructor.)

Q. Now that the sights are properly adjusted, have the small bull's-eye moved until the sights are properly aimed at it.

Q. How do you breathe while aiming? **A.** After I get my sights lined up on the bull's-eye, I draw in a little more than an ordinary breath and let out a little, and hold the remainder while aiming and squeezing the trigger.

Q. Take the prone position and aim and snap at that mark. (The instructor must assure himself that the man knows how to hold his breath properly while aiming. Many men have great difficulty in learning to do this correctly.)

Q. What is this, **A.** An aiming device.

Q. What is it used for? **A.** To show the instructor how a man is aiming.

Q. Now, I will take this rifle, and with the aid of the sandbag rest to hold the rifle steady, I will aim at the bull's-eye, and you will watch the sights through the aiming device and tell me when my aim is right and when it is wrong, and what the error is when wrong. (The instructor now aims so as to illustrate the common faults and the man must observe and call attention to them.)

Q. I will now snap at a bull's-eye a few times and you will watch through the sighting device and call where the shots would have hit.

Q. Now, take this rifle and, using the sandbag rest, aim at the bull's-eye, and I will watch you through the aiming device. (The instructor satisfies himself that the man understands sighting and aiming, and requires him to snap a few times and to call his shots.)

Q. I will take the rifle and assume the kneeling, sitting, and prone positions, and position with sandbag rest, and you will tell me whether the position is correct or incorrect in each case. (The gun sling is adjusted in all these tests.)

Q. Take this rifle and show me your kneeling, sitting, and prone positions, and position with sandbag rest.

Q. Now show me how you take the sitting and prone positions rapidly from a standing position.

Q. How do you squeeze the trigger? **A.** I squeeze the trigger with such a steady increase of pressure that I do not know just when the rifle will go off.

Q. What do you know while you are squeezing the trigger?

A. I know that the sights are lined upon the bull's-eye.

Q. If the sights are slightly out of alinement, what do you do?

A. I hold the pressure I have on the trigger and only resume the increase of pressure when the sights become lined upon the bull's-eye again.

Q. If you do this, can your shot be a bad one? **A.** No.

Q. Why? **A.** Because I cannot flinch, for I do not know when to flinch, and the sights will always be lined up with the bull's-eye, when the rifle goes off, because I never increase the pressure on the trigger, except when they are properly lined up.

Q. Is it necessary to take a long time to press the trigger in this way? **A.** No. The method of squeezing the trigger is slow at first but rapidity is developed by practice.

Q. How do you squeeze the trigger in rapid fire? **A.** I squeeze it the same way as in slow fire, with such a steady increase of pressure as not to know when the rifle will fire.

Q. In rapid fire how do you gain time so as not to be compelled to hurry in aiming and squeezing the trigger? **A.** I gain time by taking the position rapidly, working the bolt rapidly, and by keeping my eye on the target while working the bolt.

Q. How does keeping your eye on the target help you to gain time? **A.** A man who looks into the chamber while working the bolt always works it slowly so as to see the cartridges enter the barrel and he loses time in finding his own target again.

Q. What other fault, in rapid fire, comes from looking into the chamber while working the bolt? **A.** Firing on the wrong target.

Q. Show me how you work the bolt in rapid fire, prone, sitting, and kneeling.

Q. Now show me how you load a clip of service ammunition into the magazine.

Q. Is it important to get into the correct position before beginning to shoot in rapid fire? **A.** Yes; even though it takes more time, I should always get into the correct position before beginning to shoot.

Q. What is meant by "calling the shot"? **A.** To say where you think the bullet hit as soon as you shoot and before the shot is marked.

Q. How can you do this? **A.** By noticing exactly where the sights point, when the rifle goes off.

Q. If a man cannot call his shot properly, what does it usually indicate? **A.** That he did not squeeze the trigger properly and did not know where the sights pointed, at the time the rifle went off.

Q. What is this? **A.** A score book.

Q. What are these lines for (indicating the horizontal lines in the model target)? **A.** To show the amount of elevation necessary to bring the shot to the middle line.

Q. What are these lines for (indicating the vertical lines on the model target)? **A.** To show the amount of change in windage necessary to bring the shot to the middle line.

Q. If a shot hits here (indicating), what change in your sight would you make to bring the next shot to the center of the bull's-eye?

Q. What effect does moving your rear sight have on the shot? **A.** It moves it in the same direction as the rear sight moves.

Q. If you want to make a shot hit higher, what do you do? **A.** I raise my rear sight.

Q. If you want to make your shots hit more to the right, what do you do? **A.** I move my rear sight to the right.

Q. If you move your rear sight one point of windage, how much will it move the point struck by the bullet? **A.** Four inches for each 100 yards of range.

Q. Explain what you mean by that.

Q. I will place this spotter on this target (full size 500-yard target) to represent a shot properly fired by you at 500 yards with zero windage and sight set at 500 yards. Take your rifle and move your sight to bring the next shot to the center of the bull's-eye. (Instructor now tests in various ways the man's ability to make proper sight corrections.)

Q. What are the three principal uses of the score book? **A.** To show me where my shot group is located, to indicate how

much change in the sight is necessary, to move a shot or group of shots to the center of the target, and to make a record of the sight settings of my rifle for the different ranges under various weather conditions so that I will know where to set my sight when starting to shoot at each range under different weather conditions.

Q. Tell me what effect different light and weather conditions have on a man's shooting.

Q. In firing at ranges up to and including 600 yards, what is the only weather condition for which you make sight corrections? **A.** Wind.

Q. What three things do you do in cleaning a rifle after it has been fired? **A.** I first remove the powder fouling from the bore. I then dry the bore thoroughly of the liquid used in removing the fouling. After this is done I grease the bore to protect it from rust.

Q. How do you remove the powder fouling from the bore? **A.** By swabbing it thoroughly two or more times with cleaning patches saturated with water.

Q. How do you dry the bore? **A.** By running clean patches through the bore until it is thoroughly dry.

Q. How do you protect the bore from rust? **A.** By swabbing it thoroughly with a cleaning patch saturated with grease.

SECTION XII

SMALL-BORE PRACTICE

49. Object.—The object of small-bore practice is to provide a form of marksmanship training with the caliber .22 rifle and ammunition which represents the application of the principles taught in the preparatory exercises. Small-bore practice provides an excellent means of improving the shooting of organizations and sustaining interest in marksmanship throughout the year. Every effort should be made by all organizations to fire the small-bore course previous to the regular marksmanship season. The firing of this course enables the company com-

STANFORD LIBRARY

mander to visualize the state of training of his command and to concentrate his efforts on the training of those who are most deficient.

50. Value.—The chief value of small-bore practice lies in the fact that it is convenient, interest sustaining, and economical. It does not have the full value of caliber .30 practice because of the absence of recoil, but, on account of its convenience and saving in the cost of ammunition, organization commanders will find that small-bore practice is a valuable step in marksmanship training.

51. Continuous small-bore practice.—Small-bore practice should be carried on throughout the year, subject to such limitations as may be imposed by the allowance of ammunition. All persons who have never been properly instructed in shooting methods prescribed herein will be given a thorough course of preparatory instruction before being permitted to fire on the small-bore range. All small-bore practice will be properly organized and supervised in accordance with the methods of instruction as prescribed in this manual.

52. Courses to be fired.—*a.* One of the following courses should be fired. The course to be fired may be designated by higher authority or it may be selected because of training time, ammunition allowances, and availability of ranges.

COURSE E
SHORT RANGE PRACTICE

INSTRUCTION PRACTICE

TABLE I.—*Slow fire (to zero rifle)*

Range (feet)	Time	Shots	Targets	Position	Remarks
50	No limit...	5	SB-A-2.....	Prone or prone with sandbag.	Loop sling.
50	do.....	5	SB-A-2.....	Sitting.....	Do.
50	do.....	5	SB-A-2.....	Kneeling.....	Do.
50	do.....	5	SB-A-2.....	Standing.....	Hasty sling.

TABLE II.—*Slow fire*

Range (feet)	Time	Shots	Targets	Position	Remarks
50	No limit...	10	SB-A-2.....	Standing.....	Hasty sling.
50	do.....	10	SB-A-3.....	{ 5 kneeling.....	} Loop sling.
50	do.....	10	SB-B-5.....	{ 5 sitting.....	
				Prone.....	Do.

TABLE III.—*Rapid fire*

Range (feet)	Time (seconds)	Shots	Targets	Position	Remarks
50	60.....	10	SB-D-2.....	Standing to kneeling....	Loop sling.
50	75.....	10	SB-D-3.....	Standing to prone.....	Do.

NOTE.—When desired, tables I, II, and III may be fired at 1,000 inches by substituting "target A, 1,000-inch" for targets SB-A-2 and A-3; and "target B, 1,000-inch" for target SB-B-5; and "target D, 1,000-inch," for targets SB-D-2 and D-3.

INTERMEDIATE RANGE PRACTICE

INSTRUCTION PRACTICE

TABLE IV.—*Slow fire*

Range (yards)	Time	Shots	Targets	Position	Remarks
50	No limit...	10	SB-50 yards, A target.	Prone.....	Loop sling.
50	...do.....	10	...do.....	{ 5 kneeling.....	} Do.
50	...do.....	10	SB-50 yards, D target.	{ 5 sitting..... Prone to kneeling, rush 25 yards.	

TABLE V.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Targets	Position	Remarks
50	75.....	10	SB-50 yards, D target.	Standing to prone.....	Loop sling.
50	75.....	10	...do.....	Prone to prone, rush 25 yards.	Do.
50	75.....	10	...do.....	Prone to kneeling, rush 25 yards.	Do.

NOTES.—The firing included in tables IV and V is optional. If no 50-yard range is available, tables IV and V will be fired at 100 yards on the SB-100 yards D target. This note applies only to the E course.

When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

LONG RANGE PRACTICE

INSTRUCTION PRACTICE

TABLE VI.—*Slow fire*

Range (yards)	Time	Shots	Targets	Position	Remarks
100	No limit	10	SB-100 yards, A target.	Prone.....	Loop sling.
100	do	10	do	{ 5 kneeling..... 5 sitting..... Prone.....	Do.
100	do	10	SB-100 yards, D target.	Prone.....	Do.
200	do	10	SB-200 yards, A target.	do.....	Do.

TABLE VII.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Targets	Position	Remarks
100	80	10	SB-100 yards, D target.	Standing to prone.....	Loop sling.
100	100	10	do	Prone to prone, rush 25 yards.	Do.

RECORD PRACTICE

TABLE VIII.—*Slow fire*

Range (yards)	Time	Shots	Targets	Position	Remarks
100	No limit	10	SB-100 yards, A target.	Kneeling.....	Loop sling.
200	do	10	SB-200 yards, A target.	Prone.....	Do.

TABLE IX.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Targets	Position	Remarks
100	80	10	SB-100 yards, D target.	Standing to prone.....	Loop sling.
100	100	10	do	Prone to prone, rush 25 yards.	Do.

NOTE.—When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

COURSE F
SHORT RANGE PRACTICE

INSTRUCTION PRACTICE

Fire tables I, II, III, IV, and V of course E

LONG RANGE PRACTICE

INSTRUCTION PRACTICE

TABLE X.—*Slow fire*

Range (yards)	Time	Shots	Targets	Position	Remarks
100....	No limit..	10	SB-100 yards, A target.	Prone.....	Loop sling.
100....	do.....	10	SB-100 yards, D target.	do.....	Do.

TABLE XI.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Targets	Position	Remarks
100....	80.....	10	SB-100 yards, D target.	Standing to prone.....	Loop sling.
100....	100.....	10	do.....	Prone to prone, rush 25 yards.	Do.

RECORD PRACTICE

TABLE XII.—*Slow fire*

Range (yards)	Time	Shots	Targets	Position	Remarks
50....	No limit..	10	SB-50 yards, A target.	Kneeling.....	Loop sling.
100....	do.....	10	SB-100 yards, A target.	Prone.....	Do.

TABLE XIII.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Targets	Position	Remarks
50....	75.....	10	SB-50 yards, D target.	Prone to kneeling, rush 25 yards.	Loop sling.
100....	100.....	10	SB-100 yards, D target.	Prone to prone, rush 25 yards.	Do.

NOTE.—When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

COURSE G
SHORT RANGE PRACTICE

INSTRUCTION PRACTICE

Fire tables I, II, and III of course E

TABLE XIV.—*Rapid fire*

Range (feet)	Time (seconds)	Shots	Targets	Position	Remarks
50	75	10	SB-D-3-----	Prone to kneeling, rush 25 yards.	Loop sling.
50	75	10	-----do-----	Prone to prone, rush 25 yards.	Do.

RECORD PRACTICE

TABLE XV.—*Slow fire*

Range (feet)	Time	Shots	Targets	Position	Remarks
50	No limit--	10	SB-A-3-----	Kneeling-----	Loop sling.
50	-----do-----	10	SB-B-5-----	Prone-----	Do.

TABLE XVI.—*Rapid fire*

Range (feet)	Time (seconds)	Shots	Targets	Position	Remarks
50	75	10	SB-D-3-----	Prone to kneeling, rush 25 yards.	Loop sling.
50	75	10	-----do-----	Prone to prone, rush 25 yards.	Do.

NOTE.—When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

b. The following indicates the amount of ammunition for each course and the qualification scores:

Course	Ammuni- tion	Possible score	Expert	Sharp- shooter	Marks- man	Unqualified
E	230	200	180	160	130	Less than 130.
F	210	200	180	160	130	Less than 130.
G	130	200	180	160	130	Less than 130.

SECTION XIII

CALIBER .30 PRACTICE

53. General principles.—Range practice is divided into two parts:

a. Instruction practice which represents the application with service ammunition of the principles taught in the preparatory exercises. During instruction practice the soldier works under the supervision of a coach. The coaching methods prescribed in this section apply to instruction practice only.

b. Record practice in which the soldier fires for qualification as a test of his ability as a rifleman. Coaching is prohibited during the firing of record practice.

54. Importance of correct trigger squeeze.—*a.* Any man who is physically fit to be a soldier and who has had a proper course of preparatory instruction can aim and hold well enough to make a score of over 40. Scores that are under 40 are nearly always due to pressing the trigger incorrectly. The coach therefore will concentrate his attention on the trigger squeeze. He, of course, checks the position, the aiming, and the holding of the breath from time to time to see that the instruction on these points has not been forgotten, but by far the greatest amount of the coach's time will be devoted to requiring the pupil who is firing to press the trigger so steadily as not to know exactly when the discharge will take place.

b. It can always be proved to the pupil that he will be a good shot as soon as he learns to press the trigger properly, by having the coach press the trigger while the man under instruction holds and aims the rifle, as described in paragraph 58e. Shots fired in this way from either the sandbag rest position or the prone position are almost always well placed. This is a very valuable method of coaching poor shots and is often a means of improving the scores of men who are classed as good shots.

55. Order of firing.—The instruction practice firing should begin as prescribed in the tables outlining each course. These tables are made to fit the usual case, but organization commanders are not required to adhere rigidly to them when special circumstances make it advisable to modify the procedure in

order to take the best advantage of the time and ammunition and the range facilities available. The general plan of beginning with slow fire in the sandbag rest position and following with slow fire in the prone position without the sandbag will be adhered to.

56. Use of sandbag rest.—The sandbag rest is used at the beginning of the course, not to teach steadiness of hold but to facilitate instruction in the proper method of pressing the trigger. The sandbag assures such a steady hold that the temptation to the beginner to snap in his shot at the instant the sight touches or drifts past the bull's-eye, which is the cause of nearly all poor shooting, is eliminated. With the sandbag rest the sights can be held fixed at the bottom edge of the bull's-eye while the firer squeezes the trigger with such a steady pressure as not to know exactly when the rifle will go off, which is the basis of all good shooting. The habit of correct trigger squeeze, having been acquired by firing with a sandbag rest, will in all probability be retained while firing prone and in the more unsteady positions—sitting, kneeling, and standing.

57. Pads.—Men will be required to wear pads on the shoulder and, if the ground is hard, on the elbows, for the first three or four days at least. A pad can easily be improvised by putting a pair of woolen stocks under the coat or shirt so as to protect the shoulder and the upper muscles of the arm. After a few days of firing the muscles become hardened so that the pads are not essential, but it is advisable to wear them throughout the entire period of range practice.

58. Coaching.—*a. General.*—(1) During instruction practice each man on the firing line will have a coach to watch him and to help him correct errors. This statement does not mean that each man must have an old or experienced shot beside him. Any man of good intelligence who has been properly instructed in the preparatory work and who has been given instruction in coaching methods can be used with good results and should be used when more experienced coaches are not available.

(2) It is good practice to have expert coaches in charge of one or more targets, usually on a flank, to which particularly difficult pupils are sent for special coaching.

(3) Great patience should be exercised by the coach so as not to excite or confuse the firer. Everything should be done to encourage him. It is often a good plan to change coaches. It is necessary to do so when the coach shows signs of reaching the limit of his patience.

b. Position of coach.—The coach will take the same position as the man who is firing—prone, sitting, kneeling, or standing—so as to be able to watch his trigger finger and his eye.

c. Watching the eye.—Errors in trigger squeeze, which are the most serious and the hardest to correct, can be detected by watching the pupil's eye. If his eye can be seen to close as the



FIGURE 20.—Position of coach.

rifle goes off, it is because he knew when it was going off and consequently was not squeezing the trigger properly. The explosion and the shock will cause a man to wink, but this wink cannot be seen, due to the sudden movement of the head that takes place at the same time. If the firer can be seen to wink it is because he winked first and jerked the trigger afterward.

d. Use of dummy cartridges in slow fire.—If the pupil is seen to be flinching, or if he is doing poor or mediocre shooting, the coach first checks his aim by the aiming device. Having assured himself that the pupil is aiming correctly, the coach has him turn his head aside while he, the coach, puts in a cartridge and shoves the bolt home. Occasionally the coach loads in a dummy cartridge instead of a live one without letting the pupil know what he has done. Then the flinch, indicated by the shoulder being shoved forward at the same time that the trigger is pressed, will be evident even to the firer himself. The coach

then proves to him by squeezing the trigger a few times, as explained in *e* below, that his poor shooting is due to faulty trigger squeeze.

e. Coach squeezing the trigger.—(1) To squeeze the trigger for the firer, the coach lies with his right elbow on the ground to steady his hand, places his thumb against the trigger and his first finger against the back of the trigger guard. In this way he can apply pressure to the trigger by a pinching action of his thumb and first finger.

(2) The coach then watches the firer's back, and between 5 and 10 seconds after the firer begins to hold his breath he applies enough pressure to discharge the piece. Shots fired in this way are almost always accurately placed. After discharg-



FIGURE 21.—Coach squeezing trigger.

ing the piece a few times the coach lets the firer try a few shots alone, to see if he can press the trigger the same way the coach pressed it, so as not to know just when the rifle will go off. Sometimes it is necessary to repeat this exercise, but the majority of beginners can be permanently cured of the tendency to flinch by a few minutes of this kind of coaching. Old shots who are flinchers require more time and patience.

f. Duties of coach in slow fire.—(1) The coach observes the pupil carefully and corrects all errors. He pays particular attention to see—

(a) That the sights are blackened and that they are set at the correct range.

(b) That the ammunition is free from dirt.

(c) That the pupil has the correct position, gun sling properly adjusted, body at the proper angle, elbows correctly placed, and the cheek pressed firmly against the stock.

(d) That the magazine is loaded from a clip in the correct manner.

(e) That the slack is taken up promptly.

(f) Whether or not the pupil flinches (by watching his eye).

(g) That the pupil calls his shot each time he fires.

(h) That the pupil keeps his score book correctly.

(i) That the pupil is holding his breath properly (by watching his back occasionally).

(j) That the aiming is correct (by watching through the aiming device occasionally).

(2) When necessary, the coach applies the coaching methods described in *d* and *e* above.

59. Final precautions for slow fire.—The following precautions should be read over each time before going to the firing point. They will be read by the instructor to the assembled pupils at the beginning of instruction and record practice.

a. Be sure both the front and rear sights of your rifle are properly blackened.

b. Take your score book to the firing point and obtain your elevation and windage from it for the first shot.

c. Fire your first shot very carefully and then, if necessary, change the sights to bring the second shot into the bull's-eye.

d. Always aim at the bottom edge of the bull's-eye for all shots.

e. Never try to make a bullet hit closer to the bull's-eye by changing the aiming point. When you wish to change the hitting place of the bullet, do so by changing your rear sight.

f. Do not change your windage until you have looked at your score book to find out how much of a change you need; then look at your wind gage to see how much windage you have before you start to make the change.

g. Plot all of your shots in the score book. Watch the score book to see where your group is going. Try to bring the center of the group to the center of the bull's-eye by making the necessary change in your sight setting.

h. Do not change your sights unnecessarily. If you have made two or three good shots and then make a bad one, do not

change your sights on account of the bad one because it is almost certain that it is your own fault.

60. Rapid fire.—a. Importance.—The true value of a soldier as a rifle shot depends upon his ability to deliver rapid fire, or more properly speaking, continuous fire, accurately. The tendency to jerk the trigger, and consequently to flinch, is very strong in rapid fire. This tendency must be corrected before it can become a fixed habit. Constant vigilance and attention to every detail by the coach is an absolute requisite.

b. Use of dummy cartridges.—(1) Range dummy cartridges may be used in rapid fire to save ammunition if not mixed with loaded cartridges in the same clip. See paragraph 73 for safety precaution in case of misfire.

(2) Range dummy cartridges, very similar in appearance to the service ammunition, are issued by the Ordnance Department for this purpose. They are issued to use on the rifle range with loaded cartridges, and this is the only use of them which is permitted. Practice dummy cartridges of such shape and color as to be readily distinguished from the service cartridge must be used in all other exercises requiring the use of dummy cartridges.

(3) It is advisable to have each order, when it comes to the firing point, simulate a score of rapid fire, using dummy cartridges or having the cut-off turned down.

c. Use of spotters.—Spotters will be used in rapid fire on target D. When the target is run up to be marked, with a spotter in each shot hole, a picture of the group is obtained immediately. If enough issue spotters for this purpose are not available, each organization commander will have enough made for his organization. Spotters can be made out of cardboard and ordinary baling wire. A good tin spotter can also be made out of the tops of small cans.

d. Duties of the coach.—(1) The coach observes the pupil carefully and corrects all errors. He pays particular attention to see—

(a) That the sights are blackened and that they are set at the proper range.

(b) That the gun sling is properly adjusted.

- (c) That the pupil assumes the correct position.
- (d) That he takes up the slack promptly.
- (e) Whether or not the pupil flinches (by watching his eye).
- (f) That he works the bolt rapidly.
- (g) That while working the bolt the pupil keeps his eye on the target, the rifle to his shoulder, and his elbows in place.
- (h) That he reloads the magazine from a clip properly and quickly.

(2) These operations follow each other, and the coach can watch each in turn. The coach will also at times watch the pupil's back to see if he holds his breath while firing each shot. In the case of a difficult pupil it is advisable to have two coaches watching him fire.

(3) Any lack of a smooth and rapid bolt operation indicates that the preparatory training has not been sufficient, and additional preparatory rapid-fire practice will be given.

61. Final word.—Good shooting is a matter of instruction and not of mere practice. It requires no inborn talent. If the instruction is good, the shooting will be good. Practice without the proper instruction will produce only a small percentage of good shots, and those only after they have learned by long experience what they should have been taught in the beginning.

62. General provisions governing courses.—*a. Instruction practice.*—(1) The instruction practice outlined for each course is meant to serve as a guide. Only the general plan of beginning the practice in the prone position at all ranges with the sandbag rest need be followed. The amount of instruction practice to be given and the number of shots to be fired at each range will be such as to conform to the authorized ammunition allowances.

(2) The five shots in rapid fire at each range will be fired in one score of two clips, one containing five dummy cartridges, the other, five loaded cartridges. The order in which the clips are fired is optional with the firer. This form of practice is excellent training and saves ammunition. Its use at other times during the instruction practice is authorized and recommended.

(3) The amount of instruction practice is not limited to that prescribed in the tables. Such additional practice as time and ammunition allowance permit will be given.

(4) The procedure prescribed in section XV for record practice is applicable to instruction practice with the following exceptions:

(a) Scores are not required to be kept in the pit.

(b) Only such officers and noncommissioned officers are on duty in the pit as are necessary to preserve order and insure efficient pit service.

(c) The scores may be kept on the firing line in any manner authorized by the organization commander.

b. Record practice.—The order of sequence in firing the record course may be changed when local conditions make such action advisable.

63. Course A.—*a. Instruction practice.*

TABLE I.—*Slow fire*

Range (inches)	Time	Shots	Target	Position
1,000---	No limit--	5	A 1,000-inch.	Prone with sandbag, loop sling.
1,000---	do-----	5	do-----	Prone, sling optional.
1,000---	do-----	5	do-----	Sitting, sling optional.
1,000---	do-----	5	do-----	Kneeling, sling optional.
1,000---	do-----	5	do-----	Standing, sling optional.

TABLE II.—*Rapid fire*

Range (inches)	Time (seconds)	Shots	Target	Position
1,000---	60-----	¹ 5	D 1,000-inch.	Prone from standing, sling optional.
1,000---	60-----	¹ 5	do-----	Sitting or kneeling from standing, sling optional.

¹ See par. 62a (2).

TABLE III.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200-----	No limit--	5	A-----	Prone with sandbag, loop sling.
300-----	do-----	5	A-----	Do.
500-----	do-----	5	B-----	Do.

TABLE IV.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200.....	No limit..	5	A.....	Prone, loop sling
300.....	do.....	5	A.....	Do.
500.....	do.....	10	B.....	Do.

TABLE V.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200	No limit..	5	A.....	Sitting, loop sling.
200	do.....	5	A.....	Kneeling, hasty sling.
200	do.....	5	A.....	Standing, hasty sling.

TABLE VI.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
200	60.....	15	D.....	Kneeling from standing, loop sling optional.
300	70.....	15	D.....	Prone from standing, loop sling optional.

¹ See par. 62a (2).TABLE VII.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
200	70.....	15	D.....	Kneeling from prone, running 25 yards, loop sling optional.
300	80.....	15	D.....	Prone from prone, running 25 yards, loop sling optional.

¹ See par. 62a (2).

*b. Record practice.*TABLE VIII.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200	No limit..	10	A.....	5 standing, 5 kneeling, hasty sling. Prone, loop sling.
500	---do-----	10	B.....	

TABLE IX.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
300	70.....	10	D.....	Prone from standing, loop sling.

TABLE X.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
200	70.....	10	D.....	Kneeling from prone, running 25 yards, loop sling optional. Prone from prone, running 25 yards, loop sling optional.
300	80.....	10	D.....	

NOTE.—When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

64. Course B.—a. Instruction practice.

TABLE I.—*Slow fire*

Range (inches)	Time	Shots	Target	Position
1,000	No limit..	5	A 1,000-inch.	Prone with sandbag, loop sling.
1,000	-----do-----	5	-----do-----	Prone, sling optional.
1,000	-----do-----	5	-----do-----	Sitting, sling optional.
1,000	-----do-----	5	-----do-----	Kneeling, slip optional.
1,000	-----do-----	5	-----do-----	Standing, sling optional.

TABLE II.—*Rapid fire*

Range (inches)	Time (seconds)	Shots	Target	Position
1,000	60-----	¹ 5	D 1,000-inch.	Prone from standing, sling optional.
1,000	60-----	¹ 5	-----do-----	Sitting or kneeling from standing, sling optional.

¹ See par. 62a (2).TABLE III.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200	No limit..	5	A-----	Prone with sandbag, loop sling.
300	-----do-----	5	A-----	Do.

TABLE IV.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
300	No limit..	5	A-----	Sitting, loop sling.
300	-----do-----	5	A-----	Kneeling, hasty sling.
200	-----do-----	5	A-----	Standing, hasty sling.

TABLE V.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
200	60.....	15	D.....	Kneeling from standing, loop sling optional.
300	70.....	15	D.....	Prone from standing, loop sling optional.

¹ See par. 62a (2).TABLE VI.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
200	70.....	15	D.....	Prone from prone, running 25 yards, loop sling optional. Do.
300	80.....	15	D.....	

¹ See par. 62a (2).*b. Record practice.*TABLE VII.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200	No limit..	5	A.....	Standing, hasty sling.
300	do.....	10	A.....	Kneeling, sling optional.

TABLE VIII.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
300	70.....	10	D.....	Prone from standing, loop sling.

TABLE IX.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
230	70.....	10	D.....	Prone from prone, running 25 yards, loop sling optional. Do.
300	80.....	10	D.....	

NOTE.—When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

65. Course C.—*a. Instruction practice.*TABLE I.—*Slow fire*

Range (inches)	Time	Shots	Target	Position
1,000	No limit..	5	A 1,000-inch.	Prone with sandbag, loop sling.
1,000	...do.....	5	...do.....	Prone, sling optional.
1,000	...do.....	5	...do.....	Sitting, sling optional.
1,000	...do.....	5	...do.....	Kneeling, sling optional.
1,000	...do.....	5	...do.....	Standing, sling optional.

TABLE II.—*Rapid fire*

Range (inches)	Time (seconds)	Shots	Target	Position
1,000	60.....	1 5	D 1,000-inch.	Prone from standing, sling optional.
1,000	60.....	1 5	...do.....	Sitting or kneeling from standing, sling optional.

¹ See par. 62a (2).TABLE III.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200	No limit..	5	A.....	Prone with sandbag, loop sling.
200	...do.....	5	A.....	Prone, loop sling.
200	...do.....	5	A.....	Sitting, loop sling.
200	...do.....	5	A.....	Kneeling, hasty sling.
200	...do.....	5	A.....	Standing, hasty sling.

TABLE IV.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
200	60.....	1 5	D.....	Kneeling from standing, loop sling optional.
200	70.....	1 5	D.....	Prone from prone, running 25 yards, loop sling optional.

¹ See par. 62a (2).

*b. Record practice.*TABLE V.—*Slow fire*

Range (yards)	Time	Shots	Target	Position
200	No limit..	5	A.....	Kneeling, sling optional.
200	---do-----	5	A.....	Standing, hasty sling.

TABLE VI.—*Rapid fire*

Range (yards)	Time (seconds)	Shots	Target	Position
200	60-----	10	D.....	Kneeling from standing, loop sling optional.
200	70-----	10	D.....	Prone from prone, running 25 yards, loop sling optional.

NOTE.—When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

66. Course D.—a. Instruction practice.TABLE I.—*Slow fire*

Range (inches)	Time	Shots	Target	Position
1,000	No limit..	10	A 1,000-inch.	Prone with sandbag, loop sling.
1,000	---do-----	10	---do-----	Prone, sling optional.
1,000	---do-----	10	---do-----	Sitting, sling optional.
1,000	---do-----	10	---do-----	Kneeling, sling optional.
1,000	---do-----	10	---do-----	Standing, sling optional.

TABLE II.—*Rapid fire*

Range (inches)	Time (seconds)	Shots	Target	Position
1,000	60-----	¹ 5	D 1,000-inch.	Prone from standing, loop sling.
1,000	60-----	¹ 5	---do-----	Sitting or kneeling from standing, sling optional.
1,000	70-----	¹ 5	---do-----	Prone from prone, running 25 yards, loop sling optional.

¹ See par. 62a (2).

*b. Record practice.*TABLE III.—*Slow fire*

Range (inches)	Time	Shots	Target	Position
1,000	No limit..	5	A 1,000-inch.	Kneeling, sling optional.
1,000	---do-----	5	---do-----	Standing, hasty sling.

TABLE IV.—*Rapid fire*

Range (inches)	Time (seconds)	Shots	Target	Position
1,000	60-----	10	D 1,000-inch.	Kneeling from standing, loop sling optional.
1,000	70-----	10	---do-----	Prone from prone, running 25 yards, loop sling optional.

NOTE.—When 25 yards is not available, a shorter distance may be used, reducing the time 2 seconds for each 5 yards.

SECTION XIV

GENERAL PROVISIONS GOVERNING RANGE PRACTICE

67. Permanent range personnel.—The successful operation of a rifle range requires the following personnel:

a. Commissioned.—A range officer or a chief range officer and assistants.

b. Enlisted.—A noncommissioned officer in charge of the pit and such fatigue details as may be required.

68. Range officers.—*a. Appointment.*—When rifle practice is held simultaneously or successively by different organizations on a large range where more than one range officer is required, the senior officer appointed for such duty will be designated as the chief range officer. When only one range officer is appointed, he will be designated as the range officer.

b. Duties.—The chief range officer or the range officer makes timely estimates for material and labor to place the range in

proper condition for the practice season, and supervises and directs all necessary repairs to shelters, butts, targets, firing points, and telephone lines. He exercises direct supervision over the practical operation of the rifle range during the practice season. He maintains order, regulates the distribution of ranges and targets, and, in general, assists the officer in charge of firing by using the means necessary to secure efficient and accurate service from the working force of the range. He provides for the safety of the markers and any visitors. When necessary, he provides range guards and instructs them in the methods to be used for the protection of life and property within the danger area. In case there is no range officer present the senior officer on duty with troops firing performs the duties of range officer.

69. Noncommissioned officer in charge of the pit.—A competent noncommissioned officer and such assistants as the post commander may deem necessary will be detailed permanently during the practice season in charge of arrangements in the pit. The noncommissioned officer in charge of the pit is responsible to the senior range officer for the discipline and efficiency of all target details. He sees that all of the target equipment is kept in a serviceable condition; that the desired targets are ready for firing at the appointed time; and that all target details as they enter the pit are provided with the proper flags, marking disks, paste, pasters, and spotters.

70. Order of instruction and record practice.—*a.* The practice season opens with instruction practice. Each person will complete instruction practice before proceeding with record practice.

b. When record practice is once begun it is carried to completion before any other practice is permitted.

c. As a rule record practice will not be fired by any rifleman on the same day that he fires any part of instruction practice. However, when the time allotted to range practice is very limited, the officer in charge of firing may authorize record firing on the same day. Instruction and record practice will not be conducted simultaneously except on ranges where the firing

points are in echelon or where the instruction firing takes place on a different part of the range.

71. Uniform.—The uniform to be worn during instruction practice and record firing will be prescribed by the commanding officer.

72. Equipment.—The garrison belt or the field belt, stripped, will be worn during instruction practice and record firing.

73. Safety precautions.—Rifles will not be loaded in rear of the firing line (see par. 78c for rapid fire preceded by a run). On open 1,000-inch ranges having no danger area behind back stop all loading and unloading will be executed with the muzzle directed toward the target, and in rapid fire rifles will not be unlocked until firer is in prescribed firing position. If a misfire occurs, the bolt will not be opened for at least 10 seconds as it may be a hangfire.

SECTION XV

PROCEDURE GOVERNING RECORD PRACTICE

74. Organization of the firing line.—*a.* Scorers seated close to and to the right rear of the person firing.

b. Telephone operators 5 paces in rear of the firing line.

c. Persons awaiting their turn to fire 10 paces in rear of the firing line.

d. Low arm racks or rifle rests and cleaning racks 20 paces in rear of the firing line.

75. Target details.—The details for the supervision, operation, marking, and scoring of targets during record practice consist of officers, noncommissioned officers, and privates, as follows:

a. One commissioned officer assigned to each two targets. When it is impracticable to detail one officer to each two targets in the pit, an officer will be assigned to supervise the marking and scoring of not to exceed four targets. In this case the pit scores will be kept by the noncommissioned officer in charge of each target, who will sign the score card. The officer will take up and sign each score card as soon as a complete score is recorded.

b. One noncommissioned officer assigned to each target to direct and supervise the markers. This noncommissioned officer will be selected, except at a one-company post, from an organization other than the one firing on the target which he supervises. When a post is garrisoned by a single company so that it is impossible to detail noncommissioned officers of other companies to supervise the marking and scoring, those duties will be performed by the noncommissioned officers of the firing company. In record firing at such post new paper targets will be used for each day's firing. At the end of the day the company commander or one of his lieutenants will count the number of hits made in each division of the target and compare the totals with the recorded scores. Since the markers may inadvertently make errors in signaling hits, the record should be permitted to stand whenever an examination of the target gives results very closely agreeing with the recorded scores, but the markers should be cautioned to exercise greater care in the future. When there is more than one officer with the company one will be in the pit during the record firing.

c. One or two privates assigned to operate and mark each target. These privates may be selected from the organization firing on the target to which they are assigned.

76. Score cards and scoring.—a. Duplicate score cards will be kept, one at the firing point and one in the pit. These cards will be of different colors. The cards at the firing point will bear the date, the man's name, the number of the target, and the order of firing. The pit card will not show the man's name, but will bear the date, the number of the target, and the order of firing.

b. Entries on all score cards will be made in ink or with indelible pencil. No alteration or correction will be made on the card except by the organization commander, who will initial each alteration or correction made.

c. The scores at each firing point will be kept by a noncommissioned officer of some organization other than that firing on the target to which he is assigned, except in case of a 1-company garrison, when company officers will exercise special care to insure correct scoring. As soon as a score is completed the

score card will be signed by the scorer, taken up and signed by the officer supervising the scoring, and turned over to the organization commander. Except when required for entering new scores on the range, score cards will be retained in the personal possession of the organization commander and not allowed in the hands of an enlisted man from the beginning of record practice until the required reports of range practice have been rendered.

d. In the pit the officer keeps the scores for the two targets to which he is assigned. As soon as a score is completed he signs the score card. He turns these cards over to the organization commander at the end of the day's firing, or at such times as requested.

e. Upon completion of record firing and after the qualification order is issued the pit score cards of each man will be attached to his official score card kept at the firing point. These cards will be kept available for inspection among the company records for one year, and then destroyed.

77. Marking.—*a. Slow fire.*—(1) The value of the shot is indicated as follows:

- (a) A bull's-eye, with a white disk.
- (b) A four, with a red disk.
- (c) A three, with a black and white disk.
- (d) A two, with a black disk.
- (e) A miss, by waving a danger flag across the front of the target.

(f) Ricochet hits will not be counted.

(2) The exact location of the hit is indicated by placing in the shot hole a spotter of size appropriate to the distance from the firing point. The center of the marking disk is placed over the spotter in signaling hits. No spotters are required on 1,000-inch ranges.

b. Rapid fire on target D.—(1) The same disks are used to indicate the value of hits as in slow fire.

(2) Spotters are placed in the shot holes before the target is run up for marking.

(3) The marking begins with the hits of highest value, the center of the disk being placed over the spotter, then swung

off the target and back again to the next spotter, care being taken each time to show only the face of the disk indicating the value of the shot being marked. The marking will be slow enough to avoid confusing the scorer at the firing point. When one spotter covers more than one shot hole the disk is placed over it the required number of times. Misses are indicated by slowly waving the red flag across the face of the target one time for each miss. Ricochet hits will not be counted.

78. Procedure.—*a. Slow fire.*—(1) *On the firing line.*—(a) One person only will be assigned to a target in each order.

(b) The scorer, as the value of each shot is signaled, announces in a tone sufficiently loud to be heard by the firer the name of the firer, the number of the shot, and the value of the hit, and records the value of the hit on the score card of the individual who is firing.

(c) Whenever a target is marked without the individual assigned to that target having fired, as will occur when some one fires on the wrong target, the scorer will notify the officer in charge, who will notify the officer assigned to that target in the pit to disregard the shot. This precaution is necessary to prevent errors in the pit record.

(d) When an individual fires on the wrong target he will not be scored a miss until the target to which he is assigned has been pulled down and the miss signaled from the pit.

(e) If the target is not half masked at the completion of a score on that target, or if it is half masked at the wrong time, the officer in charge of that firing point will adjust the matter at once over the telephone. This precaution is necessary to prevent the error from being carried on through the scores that follow.

(2) *In the pit.*—(a) The target is withdrawn and marked after each shot, except that on 1,000-inch ranges, the targets are marked and removed after each 5 or 10 shots, and replaced with new targets.

(b) When a shot is fired at a target, it is pulled down. The noncommissioned officer indicates the location of the hit to the officer, who announces its value and records it on the score card. A spotter is then placed in the shot hole, the previous

shot hole, if any, is pasted, and the target is run up and marked. The noncommissioned officer supervises the marking of each shot. The officer also exercises general supervision over the marking.

(c) When the pit score card indicates that a score has been completed, the target is half masked for about 30 seconds as a signal of such completion to the firing line. At the end of the 30 seconds the target is pulled fully down, the spotter removed, the shot hole pasted, and the target run up for the beginning of a new score.

(d) When a target frame is used as a counterweight for a double sliding target, the blank side of such frame will be toward the firing line.

b. Rapid fire on target D.—(1) *On the firing line.*—(a) One person only will be assigned to a target in each order.

(b) When all is ready in the pit, a red flag is displayed at the center target. At that signal the officer in charge of the firing line commands: **LOAD**. The rifles are loaded and locked.

(c) The officer in charge of the firing line then calls so that all may hear, "Ready on the right? Ready on the left?" Anyone who is not ready calls out, "Not ready on No. —." If any individual fails to fire at all, he will be given another opportunity to fire, but if he fires any shots the score must stand as his record. He will not be permitted to repeat his score on the claim that he was not ready.

(d) All being ready on the firing line, the officer in charge commands: **READY ON THE FIRING LINE**. Rifles are unlocked and the position of *ready* assumed. The telephone orderly notifies the pit, "Ready on the firing line."

(e) The flag at the center target is waved and then withdrawn. Five seconds after the flag is withdrawn the targets appear, remain fully exposed for the prescribed period of time, and are then withdrawn. The firer takes the prescribed position as soon as the targets appear, and fires or attempts to fire 10 shots, reloading from a full clip taken from the belt.

(f) As soon as the targets are withdrawn the officer in charge commands: **UNLOAD**. All unfired cartridges are removed from the rifle and the bolts are left open. The men remain in posi-

tion on the firing line until they are ordered off by the officer in charge.

(g) As each shot is signaled it is announced as follows: "Target No. —, 1 five, 2 fives, 3 fives, 1 four, 2 fours, 3 fours, 4 fours, 1 three, 1 miss, 2 misses." The scorer notes these values on a pad and watches the target as he calls the shot. After the marking is finished he counts the number of shots marked, and, if more or less than 10, calls, "Re-mark No. —." If 10 shots have been marked, he then enters the score on the soldier's score card and totals it as follows: 5 5 5 4 4 4 4 3 0 0 equals 34.

(2) *In the pit.*—(a) The time is regulated in the pit by the officer in charge.

(b) When all is ready in the pit the targets are fully withdrawn and a red flag is displayed at the center target.

(c) When the message is received that the firing line is ready, the red flag at the center target is waved and withdrawn and the command **READY** is given to the pit details.

(d) Five seconds after the red flag is withdrawn the targets, by command or signal, are run up, left fully exposed for the prescribed period of time and then withdrawn.

(e) The officers in the pit examine each of their targets in turn, announce the score, and record it on the pit score card. Spotters are then placed in the shot holes and the targets run up and marked. The noncommissioned officer supervises the marking of each shot. The officer exercises general supervision over the marking.

(f) The targets are left up for about one minute after being marked and are then withdrawn, pasted, and made ready for another score. They may be left up until ordered pasted by the officer in charge of the firing line.

(g) If more than 10 hits are found on any target it will not be marked unless all of the hits have the same value. The officer in charge of the firing line will be notified of the fact by telephone.

c. Rapid fire (preceded by a run).—(1) *On the firing line.*—

(a) One person only will be assigned to a target in each order. The firing line will be 25 yards in rear of the firing point.

(b) When all is ready in the pit a red flag is displayed at the center target. At that signal the officer in charge of the firing line commands: **LOAD**. The rifles are loaded and locked. The officer in charge of the firing line commands: **LIE DOWN**.

(c) The officer in charge of the firing line then calls so that all may hear, "Ready on the right? Ready on the left?" Any one who is not ready calls out "Not ready on No. —." If any individual fails to fire at all, he will be given another opportunity to fire, but if he fires any shots the score must stand as his record. He will not be permitted to repeat his score on the claim that he was not ready.

(d) All being ready on the firing line, the officer in charge commands: **READY ON THE FIRING LINE**. The telephone orderly notifies the pit, "Ready on the firing line."

(e) The flag at the center target is waved and then withdrawn. The officer in charge of the firing line commands: **PREPARE TO RUSH**. Five seconds after the flag is withdrawn the targets appear and the officer in charge of the firing line commands: **UP**. The firers move forward at a run as described in paragraph 12e, TR 420-85, and upon arrival at the firing point, the firers lie down, assume the firing position as described in paragraph 28c, and fire or attempt to fire 10 shots, reloading from a full clip taken from the belt. The targets remain fully exposed for the prescribed period of time, and are then withdrawn.

(f) As soon as the targets are withdrawn the officer in charge commands: **UNLOAD**. All unfired cartridges are removed from the rifle and the bolts are left open. The men remain in position on the firing line until they are ordered off by the officer in charge.

(g) As each shot is signaled it is announced as follows: Target No. —, 1 five, 2 fives, 3 fives, 4 fives, 5 fives, 6 fives, 7 fives, 8 fives, 2 misses. The scorer notes these values on a pad and watches the target as he calls the shot. After the marking is finished he counts the number of shots marked and, if more than 10, calls, "Re-mark No. —." If 10 shots have been marked, he then enters the score on the soldier's score card and totals it as follows: 5 5 5 5 5 5 5 0 0 equals 40.

(2) *In the pit.*—(a) The time is regulated in the pit by the officer in charge.

(b) When all is ready in the pit a red flag is displayed at the center target.

(c) When the message is received that the firing line is ready, the red flag at the center target is waved and withdrawn and the command **READY** is given to the pit details.

(d) Five seconds after the red flag is withdrawn, the targets by command or signal are raised, left fully exposed for the prescribed period of time, and then withdrawn.

(e) The officers in the pit examine each of their targets in turn, announce the score, and record it on the pit score card. The targets are then raised and marked. The noncommissioned officer supervises the marking of each shot. The officer exercises general supervision over the marking.

(f) After being marked, the targets are lowered, pasted, and made ready for another score. They may be left up until ordered pasted by the officer in charge of the firing line.

(g) If more than 10 hits are found on any target, the officer in charge of the firing line will be notified of the fact by telephone. See paragraph 103.

d. Rapid fire on target D (rifle) 1,000-inch range.—(1) *1,000-inch range with target pit.*—(a) Rapid fire from standing position to prone, sitting, and kneeling will be conducted in the same manner as prescribed for target D, except that the miniature targets will be removed and replaced with new targets after marking.

(b) Rapid fire preceded by a run will be conducted in the same manner as prescribed in paragraph 78c, except that the miniature targets will be removed and replaced with new targets after marking.

(2) When 1,000-inch range has no target pit, the following will govern:

(a) If the targets are covered by a curtain which can be opened to expose the face of the target and closed again to conceal it, or if the targets operate on a pivot, the rapid fire will be conducted as closely as practicable in conformity with the method set forth above for 1,000-inch range with target pit.

(b) If the targets are exposed all the time, rapid fire from standing to prone, kneeling, and sitting will be conducted by the officer in charge, who commands: 1. **Lie down (kneel or sit down)**, 2. **COMMENCE FIRING**, 3. **CEASE FIRING**. Time is taken from the first command.

(c) If the targets are exposed all the time, rapid fire preceded by a run will be conducted by the officer in charge, who commands: 1. **Prepare to rush**, 2. **UP**, 3. **CEASE FIRING**. Time is taken from the command **Up**.

(d) After the command **Unload** and all unfired cartridges are removed from the rifle and the bolts are open, the officer in charge will direct the target detail to mark, remove, and replace the targets.

79. Use of telephones.—a. Telephones will be used for official communications only.

b. No one will ask over the telephone for information as to the name or organization of any person firing on any particular target, and no information of this nature will be transmitted.

c. The following expressions will be used over the telephone in the cases enumerated:

(1) When a shot has been fired and the target has not been withdrawn from the firing position, "Mark No. —."

(2) When a shot has been fired and the target withdrawn from the firing position but not marked, "Disk No. —."

(3) When the target has been withdrawn from the firing position and marked, but the value of the shot has not been understood, "Redisk No. —."

(4) When the firing line is ready for rapid fire, "Ready on the firing line."

(5) When a shot is marked on a target and the person assigned thereto has not fired, "Disregard the last shot on No. —."

SECTION XVI

RULES GOVERNING RECORD PRACTICE

80. Men marking targets not to know who is firing.—Officers and men in the pit will not know who is firing on any

particular target. Any officer or man who attempts to obtain this information or who attempts to transmit it either over the telephone or otherwise will be made the subject of disciplinary action by the proper authority.

81. Coaching prohibited.—Coaching of any nature, after the firer takes his place on the firing point, is prohibited. No person will render or attempt to render the firer any assistance whatever while he is taking his position or after he has taken his position at the firing point. Each firer must observe the location of his own hits as indicated by the marking disk or spotters.

82. Use of instruments.—*a.* The use of field glasses, telescopes, and sight-setting instruments is authorized and encouraged.

b. The use of instruments or devices for determining the force and direction of the wind is authorized and encouraged during instruction practice, but will not be used during record practice.

83. Shelter for firer.—Sheds or shelter for the firer will not be permitted at any range.

84. Restrictions as to the rifle.—Troops will use the rifle with which they are armed. The rifle will be used as issued by the Ordnance Department. The use of additional appliances, such as temporary shades for the sights, spirit levels, and orthoptic eyepieces, is prohibited. The sights may be blackened. Any authorized size of peep sight issued by the Ordnance Department may be used. Small arms and appliances issued by the Ordnance Department for test and report will not be used for determining classification.

85. Trigger pull.—The trigger pull will be at least 3 pounds, and, before record firing, will be tested (with the barrel vertical) by an officer.

86. Ammunition.—The ammunition used will be the service cartridge as issued by the Ordnance Department unless the use of other ammunition is authorized.

87. Cleaning.—Cleaning will be permitted only between scores.

88. Use of gun sling.—The gun sling will be used in connection with one arm only. For the purpose of adjustment for shooting, neither end will be removed from either sling swivel. No knot will be tied in the sling and the sling itself will neither be added to nor modified in any manner.

89. Pads and gloves.—*a.* To reduce the shock or recoil, to prevent bruising the elbows, and to prevent irritation of the upper arm by the gun sling, pads of moderate size and thickness may be worn on either shoulder, on both elbows, and on either upper arm. Pads of such size, thickness, or construction as to form artificial support for the rifle are prohibited. Shoulder pads so designed by means of excessive size or thickness, quilting, rolls, ridges, or other devices as to aid materially in retaining the rifle butt in the firing position against the shoulder are prohibited. The use of a hook, small roll, or ridge on the sleeve of the shooting coat or shirt to keep the sling in place on the arm is prohibited.

b. A glove may be worn on either hand, provided it is not used to form an artificial support for the rifle.

90. Loading pieces.—Pieces will not be loaded except by command or until position for firing has been taken.

91. Warming or fouling shots.—No warming or fouling shots will be allowed.

92. Sighting shots.—Sighting shots form no part of the score and are not recorded as such. When sighting shots are prescribed they will be fired. If, through no fault of his own, a soldier's record score has to be continued because it was not completed, he will be given sighting shots with the new score, provided such shots are prescribed for that range.

93. Shots cutting the edge of bull's-eye or line.—Any shot cutting the edge of the figure or bull's-eye will be signaled and recorded as a hit in the figure or the bull's-eye. Because the limiting line of each division of the target is the outer edge of the line separating it from the exterior division, a shot touching this line will be signaled and recorded as a hit in the higher division.

94. Slow-fire score interrupted.—If a slow-fire score is interrupted through no fault of the person firing, the unfired

shots necessary to complete the score will be fired at the first opportunity thereafter. (See also par. 92.)

95. Misses.—In all firing, before any miss is signaled, the target will be withdrawn from the firing position and carefully examined by an officer, if an officer is on duty in the pit. Whenever the target is run up and a miss is signaled, it will be presumed that this examination has been thoroughly made. No challenge of the value signaled will be entertained or resignaling of the shot allowed.

96. Accidental discharges.—All shots fired by the soldier after he has taken his place at the firing point (and it is his turn to fire, the target being ready) will be considered in his score even if his piece was not directed toward the target or is accidentally discharged.

97. Firing on wrong target.—Shots fired upon the wrong target will be entered as a miss upon the score of the man firing, no matter what the value of the hit upon the wrong target may be. In rapid fire the soldier at fault is credited with only such hits as he may have made on his own target.

98. Two shots on same target.—In slow fire, if two shots strike a target at the same time, or nearly the same time, both will be signaled; if one of these shots was fired from the firing point assigned to that target, the hit having the highest of the two values signaled will be entered on the soldier's score and no record made of the other hit.

99. Withdrawing target prematurely.—In slow fire, if the target is withdrawn from the firing position just as the shot is fired, the scorer at that firing point will at once report the fact to the officer in charge of the scoring on that target. That officer will investigate to see if the case is as represented. Being satisfied that such is the case, he will direct that the shot be not considered and that the man fire another shot.

100. Misfires in rapid fire.—In the case of a misfire the soldier will cease firing immediately, the target will not be marked, and the score will be repeated. See paragraph 73 for safety precautions.

101. Unfired cartridges in rapid fire.—Each unfired cartridge will be recorded as a miss.

102. Disabled rifle in rapid fire.—If, during the firing of a rapid-fire score, the rifle becomes disabled through no fault of the soldier, he will repeat the score. The breaking of a clip in reloading will not entitle the soldier to another score.

103. More than 10 hits in rapid fire.—When a target has more than 10 hits in rapid fire, the target will not be marked. The soldier firing on that target will repeat his score, except when all the hits on target D or on target D (rifle) 1,000-inch range have the same value, when the target will be re-marked and he will be given that value for each shot fired by him.

SECTION XVII

TARGETS AND RANGES

104. Targets.—The specifications of dimensions of marksmanship targets, together with the value of hits in their divisions, are as follows:

a. Target A, the short-range target, used for 200 and 300 yards, is a rectangle 6 feet high, 4 feet wide, black circular bull's-eye, 10 inches in diameter, value of hit, 5; center ring, 26 inches in diameter, value of hit, 4; inner ring, 46 inches in diameter, value of hit, 3; outer, remainder of target, value of hit, 2.

b. Target B, the midrange target, used for 500 and 600 yards, is a square 6 feet on a side, black circular bull's-eye, 20 inches in diameter; center ring, 37 inches in diameter; inner ring, 53 inches in diameter; outer, remainder of target. Value of hits, same as on target A.

c. Target C, the long-range target, used for 800 and 1,000 yards, is a rectangle 6 feet high and 10 feet wide, black circular bull's-eye, 36 inches in diameter; center ring, 54 inches in diameter; inner space outside of center ring bounded by vertical lines 2 feet from each end of target; outer, remainder of target. Value of hits, same as on target A.

d. Target D, the rapid-fire target, is a square 6 feet on a side and has in its middle a black silhouette representing a soldier in the prone position. Value of hits in the figure, 5; in

the space immediately outside the figure, 4; in the space immediately outside the 4 space, 3; remainder of the target, 2.

e. Targets A (rifle) 1,000-inch range and D (rifle) 1,000-inch range are a reduction of targets A and D, respectively, from 200 yards to 1,000 inches. Value of the hits on the reduced targets are the same as for targets A and D.

105. Principles governing selection.—There are two classes of ranges: *Class A* ranges, which are more or less limited in extent, and are equipped for known-distance practice; *Class B* ranges, which are of extended area and diversified terrain, and are used for combat firing. The following paragraphs refer to Class A ranges only.

a. *Rules for selection.*—As the nature and extent of the ground available for target practice and also the general climatic conditions are often widely dissimilar for different military posts, it is not possible to prescribe any particular rules governing the selection of ranges, but only to express certain general conditions to which ranges should be made to conform. In view of the extreme range and penetration of the bullet of the United States rifle, M1903, it will be found necessary in the case of many posts to have target practice conducted at a distance of several miles from the post, a condition which necessitates the establishment of a camp on or near the range. The target practice can then be conducted without the interference of post duties.

b. *Security necessary.*—For posts situated in the thickly settled localities where the extent of the military reservation is limited, the first condition to be fulfilled is that of security for those living or laboring near or passing by the range. This requirement can be secured for Class A range by selecting ground where a natural butt is available or by making an artificial butt sufficiently extensive to stop wild shots. For complete security there should be no road, building, or cultivated ground nearer than 300 yards to either flank of the range nor than 2 miles to its rear.

c. *Direction of the range.*—If possible, a range should be so located that the firing is toward, or slightly to the east of, north. Such location gives a good light on the face of the

targets during the greater part of the day. However, security and suitable ground are more important than direction.

d. Best ground for Class A range.—Smooth, level ground, or ground with only a very moderate slope, is best adapted for a range. The targets should be on the same level with the firer, or only slightly above him. Firing downhill should be avoided.

e. Size of range.—The size of the range is determined by its plan and by the number of troops that will fire over it at a time. There are two general plans used in range construction; one with a single target pit and firing points for each range, the other with firing points on one continuous line, the target pits for the various ranges being in echelon. The latter type requires more ground and is less suitable for training troops.

f. 1,000-inch range.—There are two classes of 1,000-inch ranges: those requiring a danger area behind the back stop and those which do not. Where possible, open 1,000-inch ranges requiring no danger area behind back stop for use in cities should be so sited that sparsely settled territory is behind the back stop and so located that the range will not be a noise nuisance; 1,000-inch ranges requiring a danger area behind back stop must meet the same security requirements as Class A ranges.

106. Principles governing construction.—*a. Intervals between targets.*—To reduce to a minimum the amount of labor required in preparing the range, the targets should be no farther apart than is necessary to obviate the probability of a shot being fired on the wrong target. As a general rule, the intervals between targets are equal to the width of the targets themselves; that is, at short and midrange, 6 feet; at long range, 12 feet. Where the necessity exists for as many targets as possible in a limited space, this interval may be reduced one-half without materially affecting the value of the instruction.

b. Protection for markers.—(1) On all ranges protection must be provided for the pit details. This is done by excavating a pit for the targets or by constructing a parapet in front of them, or by a combination of these methods.

(2) Where there are several targets in a row, the shelter should be continuous. It must be high enough to protect the

markers. The parapet may be of earth, with a timber or concrete revetment, of sufficient thickness to stop bullets and from $7\frac{1}{2}$ to 8 feet high above the ground or platform on which the markers stand.

c. Artificial butts.—If an artificial butt is constructed as a bullet stop, it should be of earth not less than 30 feet high and with a slope of not less than 45° . It should be extended about 5 yards beyond the outside targets and should be placed as close behind the targets as possible. The slopes should be sodded.

d. Hills as butts.—A natural hill to form an effective butt should have a slope of not less than 45° ; if originally more gradual, it should be cut into steps, the face of each step having that slope. As a temporary expedient, the face of the hill may be plowed perpendicularly to the range, but as the bullets soon cut down the furrows this measure must be frequently repeated to prevent the danger of ricochets.

e. Numbering of targets.—Each target should be designated by a number. The numbers for ranges up to 600 yards should be at least 6 feet in height and should be painted black on a white background. The arabic is preferable to the roman notation, being more readily comprehended by the soldiers; if the numbers are made of the size suggested, they will always be quickly recognized. They should be placed on the butt behind each target or on the parapet in front, and not so far above or below as to prevent the firer seeing the number when aiming at the target.

f. Measuring the range.—The range should be carefully measured and marked with stakes at each 100 yards in front of each target. The stakes should be about 12 inches above the ground and painted white. They should have in black figures the number of the corresponding target and its distance. These stakes will then designate the firing points for each target at the different distances. Particular care should be taken that each stake thus placed is at right angles to the face of its own target.

g. Ranges parallel.—The different ranges for the same distance should all be parallel, so that similar conditions with respect to wind and light may exist. It is not essential, how-

ever, that the ranges employed for long-distance shooting should be parallel to those used for the ordinary company practice.

h. Firing mounds.—If it becomes necessary to raise a firing point on account of low ground, a low mound of earth no higher than absolutely required should be made. The mound should be level, sodded, and not less than 12 feet square. If the entire firing line is raised, the firing mound should be level, sodded, and not less than 12 feet wide on top.

i. Pit shed.—A small house or shed should be built in or near the target pit, in which the marking disks and signal flags and spare parts of the target frames for making immediate repairs should be stored. It should be sufficiently large to afford a shelter for the markers in case of a sudden storm.

j. Danger signals.—A socket for the staff of the danger signals should be placed on the markers' shelter in front of each target and so inclined that the flag will always fall clear of the staff and be readily seen. This flag will always be displayed when the target is in place and not in use. In addition to the danger signals at the targets, one or more danger signals will be displayed near the range to warn passers-by when firing is in progress. These signals will not be placed in such a position as to serve as streamers for judging wind on the range. They should be placed on the roads or on the crest of the hill, where they can plainly be seen by those passing.

k. Range house.—On large ranges where competitive firing is held, a house containing a storeroom and several office rooms should be erected in some central place off the range but in its immediate vicinity. Such facilities as will enable visitors to witness the firing satisfactorily should also be provided.

l. Telephone service.—Ranges should be equipped with a telephone system connecting the target pit with each firing point, the range house, and the post. The number of telephones should not be less than one to each 10 targets.

m. Electric bells.—On large ranges the installation for each five targets of an electric bell that can be controlled from a central point in the pit adds materially to the celerity and uniformity of target manipulation for rapid fire.

n. Covered ways between pits.—Where the pits are in echelon, covered ways or tunnels should be provided between the various pits. This construction will allow the pit details to be shifted with safety without interrupting the firing.

o. Scorers' tables and cleaning racks.—The range will be provided with scorers' tables, benches, and cleaning racks.

p. 1,000-inch range.—An open 1,000-inch range requiring no danger area behind backstop must meet the following minimum requirements:

(1) Vertical bulletproof backstop and wing walls (natural or artificial) not less than 30 feet high. Wing walls must cover at least 15° on each flank. In case of artificial wing walls, they should be set at an angle of 15° with the backstop toward the firing points.

(2) Ricochet pit in front of firing points providing at least a 4° slope downward from the normal line of fire from a prone position and extending to within 30 feet of the backstop and wing walls. If a vertical cliff or wall over 40 feet high is available, no ricochet pit need be provided.

SECTION XVIII

ADVICE TO INSTRUCTORS

107. Provisions not mandatory.—The provisions of this section are given as a guide and will not be considered as having the force of regulations. They are particularly applicable to emergency conditions when large bodies of men are being trained under officers and noncommissioned officers who are not thoroughly familiar with the training methods.

108. Size of class.—*a.* The size of the class will depend largely upon local conditions, such as the size of the range, the number of men to be instructed, and the duty being performed by the troops.

b. Where range facilities permit, it is best to have an entire battalion go through target practice, the battalion being relieved from routine garrison duty during the period of preparatory training and range firing.

c. In a post garrisoned by more than one regiment, one battalion at a time on the range from each regiment would be the usual procedure, where range facilities are ample and the range is close to the post.

d. In battalion or 2-company posts half the garrison should be on the range at a time.

e. At 1-company posts the entire company will usually undergo rifle practice during the same period.

109. Place of assembly for lectures.—Any small ravine or cup-shaped area makes a very good amphitheater for giving the lecture in case no suitable building is available. As a rule a natural amphitheater that is better suited to this purpose than a building can usually be found near each post or camp.

110. Assistant instructors.—*a.* It is an advantage to have the officers and noncommissioned officers trained in advance in the prescribed methods of instruction. When troops are taking up rifle training for the first time, such training is not always practicable nor is it absolutely necessary. A good instructor can give a very clear idea of how to carry on the work in his lecture and demonstration preceding each step. In the supervision of the work following the demonstration, he can correct any mistaken ideas or misinterpretations.

b. When one instructor is conducting successive organizations through target practice, it is advisable to attach to the first organization taking the course officers and noncommissioned officers of the companies that are to follow for the period of preparatory work and for a few days of range firing. These act as assistant instructors when their own companies take up the work. Such assistants are particularly useful when one group is firing on the range and another is going through the preparatory exercises, both under the supervision of one instructor. By attaching an officer from each company and a noncommissioned officer from each platoon to groups preceding their units on the range, an adequate corps of assistants can soon be built up.

111. Inspection of equipment.—*a.* The instructor should personally inspect the equipment for the preparatory exercises before the training begins. This equipment is often so carelessly made that it is practically useless. A set of model equip-

ment should be prepared in advance by the instructor for the information and guidance of the organizations about to take up the preparatory work. The sighting bars must be made as described, and the hole representing the peep sight must be absolutely circular. If the sights are made of tin, the holes should be bored by a drill in order to have them perfectly round. Good rear sights can be made for the sighting bars by using cardboard and cutting the holes with a punch for cutting wads for 10-gage shotgun shells. These punches are cheap and can be obtained at almost any hardware store. The sighting disks for short distances must have a perfectly round, black bull's-eye, with a background of white paper or target paper. Bull's-eyes painted on a white disk are not satisfactory; they get dirty very quickly so that the outlines are not distinct. Bull's-eyes cut out of black paper with a shotgun-wad cutter and pasted on white paper make satisfactory aiming points either to paste on the face of the disk or to use in position and trigger-squeeze exercises, when small gallery targets are not available for this purpose.

b. All equipment used in the preparatory exercises must be accurate and have the appearance of being carefully made. One of the objects of these exercises is to cultivate a sense of exactness and carefulness in the minds of the men undergoing instruction. They cannot be exact with inexact instruments, and they will not be careful when working with equipment that looks carelessly made.

112. **Inspection of rifles.**—No man is required to fire with an unserviceable or inaccurate rifle. All rifles should therefore be carefully inspected far enough in advance of the period of training to permit organization commanders to replace all inaccurate or defective rifles. Rifles having badly pitted barrels are not accurate and should not be used.

113. **Ammunition.**—The careful officer will take pains to see that the best ammunition available is reserved for record firing and that the men have a chance to learn their sight settings with that ammunition before record practice begins. Ammunition of different makes and of different lots should not be used indiscriminately.

114. Organization of the work.—*a. In preparatory training.*—(1) The field upon which the preparatory work is to be given should be selected in advance and a section of it assigned to each organization. The equipment and apparatus for the work should be on the ground and in place before the morning lecture is given, so that each organization can move to its place and begin work immediately and without confusion.

(2) Each company should be organized in two lines, 10 to 15 yards apart, and facing away from each other. In this way the company officers and other instructors, whose position is normally between the lines, have all of their squads under close supervision.

(3) The arrangement of the equipment is as follows:

(a) On each line are placed the sighting bars and rifle rests at sufficient intervals to permit efficient work.

(b) Fifty feet from each line is placed a line of small boxes with blank paper tacked on one side, one box and one small sighting disk to each rifle rest.

(c) At one side of each box a tall stake, about 8 inches wide, is driven into the ground. On each stake are three aiming targets, placed at the proper height for aiming from the prone, sitting, and standing positions.

(d) Two hundred yards from each line is placed a line of frames suitable for 200-yard shot group exercises, one frame to each squad. These frames have blank paper tacked or pasted on the front. A 10-inch sighting disk is placed with each frame. Machine-gun targets make acceptable frames for this work.

(4) In rapid-fire exercises the company is organized in one line, with D targets placed 200, 300, and 500 yards away.

(5) When sufficient level ground is not available for the above arrangement the organizations will have to vary from it in some particulars. It will nearly always be found, however, that all of the work except the long-range shot group work can be carried on in two lines.

b. In range practice.—(1) The range work should be so organized that there is a minimum of lost time on the part of each man. Long periods of inactivity while awaiting a turn on the firing line should be avoided. For this purpose no more men

should be on the range at one time than the number of targets available can accommodate efficiently, and waiting periods should be utilized in some form of instruction.

(2) The local conditions and the nature of the ground in the vicinity of the range will largely influence the means used to prevent loss of time.

(3) As a general rule six men per target is about the maximum and four men per target the minimum for efficient handling.

(4) When men are not in the pit or on the firing line their time can be spent in rapid-fire exercises, in sight-setting and sight-changing exercises, in preparatory exercises for pistol firing or actual pistol practice, in theoretical instruction in the use of the automatic rifle, in practice in estimating distance, in preparatory individual musketry exercises, or in such other forms of training as they need and the ground permits.

(5) Whatever means are employed to occupy this time the work must be well organized under a competent instructor and must be made interesting to the men. To go through an exercise in a perfunctory way merely to occupy the time is worse than useless.

(6) When it is desired to carry on pistol firing at the same time as rifle firing there may be a line of pistol targets set on the ground and to the flank of each rifle firing point, the pistol range being separated from the rifle range by 50 to 100 yards and the firing point being on the same line.

(7) In rapid fire it is advisable to have on the line the order that is next to fire and to have them practice with dummy ammunition or simulated fire. When the size of the firing point makes this action impracticable each order should be given a score of simulated fire before firing with ball cartridges or with ball and range dummy cartridges mixed.

(8) Subject to ammunition allowances the following method of carrying on range practice has been found to produce uniformly excellent results when the full allowance of time is devoted to the training:

(a) Organizations camp on the range (if it is more than a mile from the post).

(b) Firing is begun by a group consisting of approximately half of each organization. This group is made up of those proved to be the best by the examination on preparatory work and those known to be good shots. Under ordinary circumstances an allowance of from four to six men per target would result. The men who are not included in this first group make up all the pit details and undergo additional preparatory training, particularly in rapid fire.

(c) After about 30 hours' instruction practice all of the first group, except those few who have not been shooting well, fire for record.

(d) The second group, made up of those who have not fired and those who were rejected from the first group, now begins firing. The men who have completed record firing perform all fatigue.

(e) After about 30 hours' instruction practice all of this second group, who have been shooting well and have a very good chance to qualify, fire for record.

(f) During the remainder of the allotted time the efforts of the officers and noncommissioned officers are concentrated on the men who were not ready to fire for record with the second group. This last group fires for record by the end of the allotted time for range practice.

(9) When range facilities are such that the entire organization can fire at one time without having more than four or, at the most, six men per target, the same general scheme as that outlined above may be applied as follows:

(a) Firing is begun with all of the men of the organization taking part.

(b) After about 30 hours' instruction practice, all except those who have not been shooting well fire for record.

(c) The efforts of the instructors are concentrated on the remnant of the organization for the rest of the allotted time.

115. Model schedules.—The following schedules are suggested as guides, having six men per target:

*a. For course A.***TUESDAY**

	<i>Hours</i>
First step: Sighting and aiming-----	3
Second step: Positions-----	4
Care and cleaning of the rifle-----	1

WEDNESDAY

Third step: Trigger squeeze-----	5
Fourth step: Rapid fire-----	3

THURSDAY

Fourth step: Rapid fire-----	3
Sight setting and sight changing exercises-----	1
Score-book exercises-----	1
Final examination-----	2
Lecture on range practice-----	1

FRIDAY

Table I (simulated)-----	2
Table I-----	5

SATURDAY

Table II (simulated)-----	2
Table II-----	3

MONDAY

Tables III and IV, 200 yards (simulated)-----	1
Tables III and IV, 200 yards-----	3
Tables III and IV, 300 yards (simulated)-----	1
Tables III and IV, 300 yards-----	3

TUESDAY

Tables III and IV, 500 yards (simulated)-----	1
Tables III and IV, 500 yards-----	3
Table V (simulated)-----	1
Table V-----	3

WEDNESDAY

	<i>Hours</i>
Table VI, 200 yards (simulated)-----	1
Table VI, 200 yards-----	1
Table VI, 300 yards (simulated)-----	1
Table VI, 300 yards-----	1

THURSDAY

Table VII, 200 yards (simulated)-----	1
Table VII, 200 yards-----	1
Table VII, 300 yards (simulated)-----	1
Table VII, 300 yards-----	1
Table VIII-----	4

FRIDAY

Table IX-----	2
Table X-----	2

b. For courses B, C, and D.—The preparatory exercises and 1,000-inch firing are the same as course A. All other firing is conducted in a manner similar to course A reducing the time accordingly.

116. Value of lectures.—The lectures at the beginning of each step are an important part of the instructional methods. They are valuable in peace times and absolutely necessary in war times.

117. Method of giving lectures.—*a.* The lectures should be given to the assembled command or group undergoing preparatory rifle training up to and including a regiment or body of recruits of similar size.

b. The best qualified officer should be selected to make the talks and give the demonstrations for the entire group undergoing training. When a battalion takes up rifle training the talks and demonstrations should not as a rule be made by the captain or a lieutenant of each company. There is usually one officer available who by reason of his knowledge of the methods, and particularly of his personality, force, and clearness of dic-

tion, is better equipped than anyone else to do this work. This officer should be detailed for this duty and should make his talks and demonstrations to the assembled units. It is not necessary that he be an expert shot.

c. The notes on lectures which follow are to be used merely as a guide. The points which experience has shown to be the ones which usually require elucidation and demonstration are placed in headings in italics. The notes which follow each heading are merely to assist the instructor in preparing his lecture. The lecturer should know in advance what he is going to say on the subject. Under no circumstances will he read over to a class the outlines for lectures contained herein, nor will he read a lecture prepared by himself. During the lecture the headlines in italics made out by himself serve as a guide as to the order in which the subjects are to be discussed. If he cannot talk interestingly and instructively on each subject without further reference to notes, he should not be giving the lectures at all.

d. The one important thing is to show the men undergoing instruction, by explanation and demonstration, just how to go through the exercises and to tell them why they are given these exercises.

118. First lecture; sighting and aiming.—*a.* The class is assembled in a building or natural amphitheater in the open, where all can hear the instructor and see the demonstrations.

b. The following equipment is necessary for the demonstrations:

- (1) One sighting bar.
- (2) One rifle rest.
- (3) One rifle.
- (4) One small sighting disk.
- (5) One 10-inch sighting disk.
- (6) One small box.

c. The following subjects are the ones usually discussed in the first lecture:

(1) *Value of knowing how to shoot.*—(*a*) The rifle is the principal weapon of the Infantry in war. Expertness in its use gives the individual confidence and a higher morale.

(b) Individual proficiency increases the efficiency of Infantry as a whole.

(c) Rifle firing is good sport.

(2) *Object of target practice.*—(a) To teach men how to shoot.

(b) To show them how to teach others.

(c) To train future instructors.

(3) *Training to shoot well.*—(a) Any man can be taught to shoot well. Shooting is a purely mechanical operation which can be taught to anyone physically fit to be a soldier.

(b) It requires no inborn talent such as to play a violin or paint a picture.

(c) There are only a few simple things to do to shoot well, but these things must be done in a manner exactly right. If they are done in a manner only approximately right, the results will be poor.

(4) *Method of instruction.*—(a) The method of instruction is the same as in teaching any mechanical operation.

(b) The instruction is divided into steps. The man is taught each step and practices it before going to the next step. When he has been taught all of the steps he is taken to the rifle range to apply what he has learned.

(c) If he has been properly taught the various preparatory steps, he will do good shooting from the very beginning of range practice.

(d) Explain coach-and-pupil method. Why used.

(5) *Reflecting attitude of instructor.*—If the instructor is interested, enthusiastic, and energetic, the men will be the same. If the instructor (squad, section, or platoon leader) is inattentive, careless, and bored, the men will be the same and the scores will be low.

(6) *Examination of men on preparatory work.*—Each man is examined in the preparatory work before going to the range. An outline of this examination is given in paragraph 48. The questions and answers in this paragraph are of material assistance while going through the exercises of each step. Refer to them constantly during the preparatory period.

(7) *Method of marking blank form.*—Explain blank form, paragraph 15 c (3). Explain marking system by the use of a blackboard, if available.

(8) *Five essentials to good shooting.*—(a) Correct sighting and aiming.

(b) Correct position.

(c) Correct trigger squeeze.

(d) Correct application of rapid-fire principles.

(e) Knowledge of proper sight adjustments.

(9) *Today's work.*—First step, sighting and aiming.

(10) *Demonstration of first sighting and aiming exercise.*—Have a squad on stage or platform and show just how this exercise is carried on.

(11) *Demonstration of second sighting and aiming exercise.*—Assume that some of the squad have qualified in the first exercise. Put these men through the second sighting and aiming exercise and show just how it is done.

(12) *Demonstration of third sighting and aiming exercise.*—

(a) Assume that some of the squad have qualified in the second sighting and aiming exercise. Put these men through the third sighting and aiming exercise and show just how it is done.

(b) Show how the squad is organized by the coach-and-pupil method so as to keep each man busy all the time.

(13) *Long-range shot group work.*—Show the class the disk for 200-yard shot group work. Explain how this work is carried on and why. Show some simple system of signals that may be used.

(14) *Final word.*—(a) Start keeping your blank form today.

(b) Organize your work so that all men are busy at all times.

(15) *Are there any questions?*

(16) *Next lecture will be tomorrow or —.* (State hour and place.)

119. Second lecture; positions.—a. The following equipment is necessary for the demonstrations in this lecture:

(1) One rifle with sling.

(2) One sandbag.

(3) One box with small aiming target.

(4) One aiming device.

(5) **Material for blackening sights.**

b. The following subjects are the ones usually discussed in the second lecture :

(1) *Importance of each step.*—(a) Each step includes all that has preceded.

(b) Each step must be thoroughly learned and practiced or the instruction will not be a success.

(2) *Necessity for correct positions.*—No excellent shot varies from the normal positions. Few men with poor positions are even fair shots. Few men with good positions are poor shots. Instruction in positions involves correct aiming.

(3) *Blackening the sights.*—Explain why and demonstrate how this is done.

(4) *Gun sling.*—Demonstrate both of the gun-sling positions and explain why they are used, and when each is used.

(5) *Taking up the slack.*—Show the class the slack on the trigger. Explain why it is taken up in the position exercises. (Cannot begin to squeeze the trigger until the slack has been taken up.)

(6) *Holding the breath.*—Explain the correct manner of holding the breath and have the class practice it a few times. Explain how the coach observes the pupils' breathing by watching their backs.

(7) *Aiming device.*—Show how it is placed on the rifle and how it is used.

(8) *Position of the thumb.*—May be either over the stock or along the side of the stock. Explain why.

(9) *Joint of the finger.*—Trigger may be pressed with first or second joint. Second joint preferable when it can be done conveniently.

(10) *Prone position.*—(a) Demonstrate correct prone position, calling attention to the elements which go to make up a correct prone position; gun sling properly adjusted, body at the correct angle, legs spread well apart, position of the butt on the shoulder, position of the hands on the rifle, position of cheek against the stock, position of elbows.

(b) Mention the usual faults which occur in prone position.

(c) Demonstrate the correct position again.

(11) *Sandbag rest position.*—(a) Demonstrate in the same manner as described above for prone position.

(b) Demonstrate coach adjusting sandbag to the pupil.

(12) *Sitting position.*—Demonstrate in the same manner as described above for the prone position.

(13) *Kneeling position.*—Demonstrate in the same manner as described above for the prone position.

(14) *Standing position.*—Demonstrate in the same manner as described above for the prone position.

(15) *Assuming the prone position rapidly.*—(a) Prone position can be assumed and an aimed shot fired more rapidly than from any other position.

(b) Its application in war.

(c) Demonstrate, first by the numbers and then as one smooth movement.

(16) *Today's work; position exercises.*—(a) Demonstrate the duties of a coach in a position exercise, calling attention to each item.

(b) Demonstrate the position of the coach. Always placed so that he can watch the pupil's finger and eye.

(c) Place a squad on an elevated platform and show how the squad leader organizes it by employing the coach-and-pupil method, so as to keep every man occupied.

(d) Continue the long-range triangle work today.

(17) *Do not squeeze the trigger today.*—Take up the slack in these exercises but do not squeeze the trigger.

(18) *Keep the blank forms up to date.*—Examine each man in the squad at the end of the day's work and assign him a mark.

(19) *Are there any questions?*

(20) *Next lecture will be tomorrow or ———.* (State hour and place.)

120. Third lecture; trigger squeeze.—a. The following equipment is necessary for the demonstrations:

(1) One rifle with sling.

(2) One aiming device.

(3) One sandbag.

(4) One box with small aiming target.

b. The following subjects are the ones usually discussed in the third lecture:

(1) *Trigger squeeze most important.*—Read paragraph 32.

(2) *Sandbag rest.*—Explain why it is used in trigger-squeeze exercise.

(3) *Machine rest example.*—Lay the rifle on the table, pointing down the room and toward an imaginary target; assume that it is in a machine rest which runs on a track parallel to the line of targets; assume that you fire a shot which hits the left edge of a 36-inch bull's-eye 1,000 yards away; then move the rifle 36 inches to the right on the table as if it were sliding along the parallel track and assume that another shot is fired. Where does it hit? Answer: The right edge of the bull's-eye. Move the rifle backward and forward between these two positions and assume a shot is fired any time while it is moving. Where will it hit? Answer: In the bull's-eye. Now assume that you hold the butt of the rifle still and move the muzzle a fraction of an inch. Where will it hit? Answer: It will miss the whole target. It hits the target when the whole rifle moves, but misses it when only one end moves.

(4) *Pulsations of body.*—The natural movements of the body and its pulsations produce more or less parallel movement of the rifle. Very often men who are apparently very unsteady make good scores. You thus see that if you squeeze the trigger so as not to know when the rifle will go off, the shot is displaced only by the amount of the parallel movement and will be a good one. But if you give the trigger a sudden pull, or flinch, you deflect one end of the rifle, and the shot will be a poor one.

(5) *Aim and hold.*—If he is physically fit to be a soldier any man can easily learn to hold a good aim for quite a long time; 15 to 20 seconds at least. Poor shots are the men who spoil this aim when they set the rifles off.

(6) *Coach squeezing the trigger.*—(a) The fact that when the coach squeezes the trigger for the firer the shot is almost invariably a good one proves that poor shooting is all due to errors in the trigger squeeze.

(b) It is not necessary for the coach to watch the sights through the aiming device. By watching the firer's back he

knows when he is aiming and then presses steadily on the trigger. Demonstrate how it is done.

(7) *Flinchers.*—Flinching is an instinctive and subconscious act which no man can control. Any man who gives the trigger a sudden pressure will flinch. Excellent shots are the men who avoid this flinching by pressing the trigger in such a way as not to know when the discharge will take place.

(8) *When the rifle goes off before the man is ready.*—Often a man who has been doing poor shooting will state upon firing a shot, "I cannot call that shot. It went off before I was ready." Almost invariably these shots are well placed. His poor shooting has been caused by "getting ready" for them.

(9) *Calling the shot.*—Explain calling the shot and why it is done.

(10) *Today's work; trigger-squeeze exercise.*—(a) Demonstrate the duties of a coach in a trigger-squeeze exercise by calling attention to each item.

(b) The work is carried on as in position exercises, with the squeezing of the trigger added.

(c) Practice in the prone position only this morning, first with, then without, the sandbag.

(d) Finish up the long-range shot group work today.

(11) *Keep the blank forms up to date.*—Examine each man in the squad at the end of the day's work and assign him a mark.

(12) *Final word.*—Do not let yourselves become bored with this work. It is easy to learn, but it takes a lot of practice to train the muscles and to get in the habit of doing the right thing without thinking.

(13) *Are there any questions?*

(14) *Next lecture will be tomorrow or ———.* (State hour and place.)

121. Fourth lecture; rapid fire.—a. The following equipment is necessary for the demonstrations:

(1) One rifle with gun sling.

(2) Two clips of practice dummy cartridges.

(3) A short piece of cord.

b. The following subjects are the ones usually discussed in the fourth lecture:

(1) *Rapid fire true test of good shot.*—Superiority of fire in battle depends on the ability to deliver rapid and accurate fire.

(2) *Fire to be accurate.*—(a) Fire that is rapid without being accurate is of no value.

(b) Trigger squeezed the same as in slow fire.

(3) *Meaning of rapid fire.*—Rapid fire is merely continuous fire. The rapidity comes from working the bolt quickly, reloading the clips into the magazine smoothly, and keeping the eye on the target while operating the bolt.

(4) *Keeping the eye on the target.*—(a) Explain the advantages of this and how it gains time.

(b) Demonstrate the correct way to operate the bolt and the way a man does it who looks into the magazine each time.

(5) *Application in war.*—Explain the advantage of keeping the eye on the target in war.

(6) *Bolt-operation exercise.*—(a) Show how the trigger is tied back to the trigger guard and explain why.

(b) Demonstrate the exercise.

(7) *Operating the bolt in rapid fire.*—Show how it is done in the prone position and in the sitting positions, calling attention to the details in each case. (Trigger not tied in this demonstration.)

(8) *Necessity for great amount of rapid-fire practice.*—(a) A smooth and rapid bolt operation on the part of a soldier materially increases his rapid-fire scores and his efficiency in battle.

(b) Practice in loading clips of cartridges into the magazine also necessary.

(9) *The correct position.*—Even if it takes a few seconds longer, get into the correct position before starting to shoot.

(10) *Today's work; rapid-fire exercise.*—(a) Explain how exercises are to be carried on.

(b) Demonstrate the duties of a coach in a rapid-fire exercise, calling attention to each item.

(c) First hour today will be given to bolt-operation exercise and it will be repeated in short periods from time to time until each man qualifies.

(d) Some practice will be had in taking positions rapidly.

(11) *Keep the blank forms up to date.*—Examine each man in the squad at the end of the day's work and assign him a mark.

(12) *Are there any questions?*

(13) *Next lecture will be tomorrow or ———.* (State hour and place.)

122. Fifth lecture; effect of wind and light, sight changes, score book.—*a.* This part of the preparatory instruction can be given on any day in which the weather forces the work to be done indoors. If no bad weather occurs, this work should follow rapid-fire instruction.

b. The following equipment is necessary for the demonstrations:

(1) One A, B, and D target for each range at which each of these targets is to be used in range practice. These targets to be mounted on frames and marked with the proper windage and elevation lines.

(2) Ten spotters that can readily be stuck into the targets.

(3) Each man to have his rifle and a score book.

c. The following subjects are the ones usually discussed in the fifth lecture:

(1) *Targets.*—(*a*) Explain the divisions on the targets and give the dimensions of each.

(*b*) Call attention to windage and elevation lines. Have class compare them with diagram in the score book. Explain why lines are farther apart as the range increases.

(2) *Weather conditions.*—All weather conditions disregarded except wind.

(3) *Wind.*—(*a*) Explain how the direction of the wind is described.

(*b*) Explain how the velocity of the wind is estimated.

(*c*) Explain the effect of wind. Effect increases with distance from target.

(4) *Wind rule.*—State rule and explain it.

(5) *Wind-gage rule.*—State rule and explain it.

(6) *Elevation rule.*—State rule and explain it.

(7) *Light.*—Explain effect.

(8) *Mirage.*—Tell what it is and how it assists riflemen.

(9) *Shooting up or down hill.*—(a) Explain the effect on elevation.

(b) Remember this rule when shooting at hostile airplane.

(10) *Score book.*—(a) Explain the uses of score book on range.

(b) Have class open score books and explain items of keeping a score point by point.

(11) *Exercises.*—Give the class a number of small problems along the lines of the examples in paragraphs 45 and 47 as a demonstration as to how the day's work is to be carried on.

(12) *Today's work.*—(a) Study and practice in sight setting, sight changing, and the use of score book. Squad leaders and other instructors will work up problems for their groups. Coach-and-pupil method is also used in which the coach states the conditions for the pupil.

(b) Additional practice in the exercises of the preceding days and rapid-fire exercises.

(13) *Are there any questions?*

(14) *Next lecture will be tomorrow or ———.* (State hour and place.)

123. Sixth lecture; range practice.—This lecture and demonstration should immediately precede range firing. If the class is not too large, it should be given on a firing point of the rifle range.

a. The following equipment is necessary for the demonstrations:

- (1) Material for blackening sight.
- (2) One rifle with gun sling.
- (3) One sandbag.
- (4) One aiming device.
- (5) Range dummy cartridges.

b. The following subjects are the ones usually discussed in the sixth lecture:

(1) *Preparatory work applied.*—Range practice is carried on practically the same as a trigger-squeeze exercise except that ball cartridges are used.

(2) *Coaching.*—(a) Each man must be coached during each shot in instruction practice.

(b) Coach watches the man, not the target. Coach does not keep the score for the pupil. Pupil must make his own entries in his score book. Coach sees that he does this.

(3) *Officers and noncommissioned officers.*—(a) Supervise and prompt the men acting as coaches.

(b) Personally coach pupils who are having difficulty in making good scores.

(4) *Spotters.*—(a) Use in both slow and rapid fire.

(b) If a spotter near the edge of the bull's-eye bothers the pupil in aiming, it may be removed before he fires again.

(5) *Sandbag rest.*—(a) Explain why it is used the first day or two of range fire.

(b) Demonstrate a coach adjusting the sandbag to a pupil.

(6) *Watching the eye.*—Explain how this indicates whether or not the pupil is squeezing the trigger properly.

(7) *Position of the coach.*—Demonstrate in each one of the positions.

(8) *Demonstration of coaching in slow fire.*—(a) Place a man on the firing point and show just what a coach does by calling attention to each item. See paragraph 58 f.

(b) Demonstrate the use of the aiming device.

(c) Demonstrate the use of dummy cartridges in slow fire.

(d) Demonstrate coach squeezing the trigger for pupil.

(9) *Demonstration of coaching in rapid fire.*—Same procedure as in paragraph 60 d.

(10) *Use of range dummy cartridges in rapid fire.*—(a) Show how range dummy cartridges are mixed with service cartridges for rapid-fire training and explain why this is done.

(b) Coaches will be alert in this kind of practice in order to prevent pupil from looking into the chamber.

(11) *Read final precautions for slow fire.*—See paragraph 59.

INDEX

	Paragraph	Page
Accidental discharges, record practice.....	96	99
Aiming device, use.....	19	26
Ammunition:		
Selection.....	113	107
Used for record practice.....	86	97
Battalion commander; duties in connection with rifle training.....	14	10
Bolt mechanism, functioning.....	10	7
Bolt operation, rapid fire.....	34	48
Breath, holding while aiming.....	19	26
Butts:		
Artificial.....	106	102
Hills as.....	106	102
Caliber .30 practice:		
Classification.....	53	72
Course A.....	63	79
Course B.....	64	82
Course C.....	65	84
Course D.....	66	85
Order of firing.....	55	72
Rapid fire.....	60	77
Slow fire; final precautions.....	59	76
Calling the shot.....	31	46
Canting the rifle.....	43	55
Coaching:		
Caliber .30 practice.....	58	73
Prohibited in record practice.....	81	97
Company commander; duties in connection with rifle training.....	14	10
Danger signals.....	106	102
Dummy cartridges, use.....	60	77
Electric bells on ranges.....	106	102
Elevation rule.....	40	55
Equipment:		
Inspection.....	112	107
Range.....	14	10
Range practice.....	72	88
Rifle training, for each squad.....	14	10
Examination of men before starting range practice.....	48	60
Firing line; organization in record practice.....	74	88
Firing mounds.....	106	102
Firing on wrong target, record practice.....	97	99
Gloves, use in record practice.....	89	98

INDEX

	Paragraph	Page
Gun sling:		
Hasty sling adjustment.....	19	26
Instruction in use.....	19	26
Loop adjustment.....	19	26
Record practice, use.....	88	98
Inspection:		
Equipment.....	111	106
Rifles.....	5, 112	3, 107
Instruction, marksmanship:		
Lectures:		
Effect of wind and light, sight changes, score book.....	122	121
Place of assembly.....	109	106
Positions.....	119	115
Range practice.....	123	122
Rapid fire.....	121	119
Sighting and aiming.....	118	113
Trigger squeeze.....	120	117
Model schedules.....	115	110
Organization of the work.....	114	108
Size of class.....	108	105
Instructors:		
Advice.....	107-	105-
	123	122
Assistant.....	110	106
Kneeling position.....	24	35
Light; effect on aiming.....	41	54
Magazine mechanism, functioning.....	11	8
Markers, protection.....	106	102
Marking:		
Men marking targets not to know who is firing.....	80	96
Record practice.....	77	90
Marksmanship, instruction in. <i>See</i> Instruction, marksmanship.		
Metal fouling, removal.....	8	5
Metal fouling solution, formula.....	8	5
Mirage: use in judging direction and velocity of wind.....	39	53
Officer in charge of rifle instruction, duties.....	14	10
Pads:		
Record practice, use.....	89	98
Use in caliber .30 practice.....	57	73
Pit shed.....	106	102
Platoon leader; duties in connection with rifle training.....	14	10
Position exercises.....	27	38
Practice season:		
Regular.....	13	9
Supplementary.....	13	9
Prone position.....	21, 28	32, 39
Range house.....	106	102

INDEX

Range practice:	Paragraph	Page
Equipment.....	72	88
Noncommissioned officer in charge of pit.....	69	87
Order of instruction and record practice.....	70	87
Permanent range personnel.....	67	86
Range officers.....	68	86
Safety precautions.....	73	88
Uniform.....	71	88
Ranges:		
Construction, principles governing.....	106	102
Covered ways between pits.....	106	102
Measuring.....	106	102
Parallel.....	106	102
Selection, principles governing.....	105	101
Rapid fire:		
Bolt operation exercise.....	34	48
Caliber .30 practice.....	60	77
Exercise.....	35	50
General principles.....	33	47
Record practice:		
Accidental discharges.....	96	99
Ammunition.....	86	97
Cleaning permitted only between scores.....	87	97
Coaching prohibited.....	81	97
Disabled rifle in rapid fire.....	102	100
Firing on wrong target.....	97	99
Gun sling, use.....	88	98
Instruments, use encouraged.....	82	97
Loading pieces.....	90	98
Marking.....	77	90
Men marking targets not to know who is firing.....	80	96
Misfires in rapid fire.....	100	99
Misses.....	95	99
More than 10 hits in rapid fire.....	103	100
Organization of the firing line.....	74	88
Pads and gloves.....	89	98
Procedure.....	78	91
Rifle, restrictions.....	84	97
Score cards and scoring.....	76	89
Shelter for firer not permitted.....	83	97
Shots cutting edge of bull's-eye or line.....	93	98
Sighting shots.....	92	98
Slow-fire score interrupted.....	94	98
Target details.....	75	88
Telephones, use.....	79	96
Trigger pull.....	85	97
Two shots on same target.....	98	99

INDEX

	Paragraph	Page
Record practice—Continued.		
Unfired cartridges in rapid fire.....	101	99
Warming or fouling shots.....	91	98
Withdrawing target prematurely.....	99	99
Recruits; instruction with the rifle.....	13	9
Rifle:		
Bolt mechanism.....	10	7
Care and cleaning—		
After firing.....	7	4
Garrison.....	6	3
Importance.....	4	1
Metal fouling.....	8	5
On the range.....	9	;
Effective range.....	2	1
Inspections.....	5,	3,
	112	107
Magazine mechanism.....	11	°
Nomenclature.....	3	1
Precautions to be taken.....	12	8
Rates of fire.....	2	1
Restrictions, in record practice.....	84	97
Type.....	1	1
Rifle rest, how made.....	14	10
Rifle training:		
Apparatus, use.....	13	9
Battalion commander, duties.....	14	10
Caliber .30 practice.....	53-66	72-85
Company commander.....	14	10
Continuous practice.....	13	9
Effect of wind, sight changes, use of score book.....	36-47	51-58
Equipment for each squad.....	14	10
Examination of men before starting range practice.....	48	60
Instruction.....	15	13
Officer in charge of rifle instruction.....	14	10
Platoon leader, duties.....	14	10
Positions.....	19-29	26-43
Range practice.....	67-73	86-88
Rapid fire.....	33-35	47-50
Record practice.....	74- 88-	
	103	100
Recruit instruction.....	13	9
Regular practice season.....	13	9
Sergeant, duties.....	14	10
Sighting and aiming.....	16-18	20-24
Small-bore practice.....	49-52	65-66
Squad leader, duties.....	14	10
Subjects taken up during preparatory period.....	15	13
Supplementary practice season.....	13	9
Safety precautions; range practice.....	73	88

INDEX

	Paragraph	Page
Sandbag rest position.....	22	33
Sandbag rest; used in caliber .30 practice.....	56	73
Score book:		
Exercises.....	47	58
Use.....	46	57
Score cards and scoring; record practice.....	76	89
Scorers' tables and cleaning racks.....	106	102
Sergeant; duties in connection with rifle training.....	14	10
Shelter for firer not permitted.....	83	97
Shooting up or down hill.....	44	55
Shots:		
Cutting edge of bull's-eye or line.....	93	98
Sighting, record practice.....	92	98
Warming or fouling, not permitted in record practice.....	91	98
Sight alinement.....	16	20
Sighting and aiming exercise:		
First, instruction.....	16	20
Second, instruction.....	17	24
Second, position.....	17	24
Third, instruction.....	18	24
Third, position.....	18	24
Sighting bar:		
Construction.....	14	10
Use of.....	16	20
Sighting disk, construction.....	14	10
Sights, blackening of.....	19	26
Sight-setting and sight-changing exercises.....	45	55
Sitting position.....	23, 29	35, 43
Slow fire; caliber .30 practice.....	59	76
Small-bore practice:		
Continuous.....	51	66
Course.....	52	66
Object.....	49	65
Value.....	50	66
Spotters, use.....	60	77
Squad leader; duties in connection with rifle training.....	14	10
Standing position.....	25	35
Standing trench, positions.....	26	36
Target details; record practice.....	75	88
Targets:		
Numbering.....	106	102
Specifications.....	104	100
Telephone service on ranges.....	106	102
Telephones; use in record practice.....	79	96
Training, rifle. <i>See</i> Rifle training.		
Trigger pull, test.....	85	97

INDEX

	Paragraph	Page
Trigger squeeze:		
Correct, importance.....	54	72
Exercise.....	32	46
Importance.....	30	45
Uniforms; range practice.....	71	88
Wind:		
Effect.....	36	51
Rule for sighting.....	37	52
Wind-gage rule.....	38	53
Zero of a rifle.....	42	54



W 3.63 = 3 Pt. 1 / ch. 1A

WAR DEPARTMENT

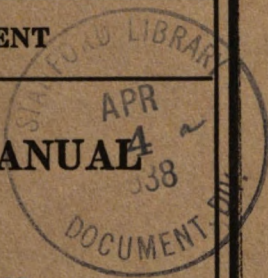
BASIC FIELD MANUAL



**Volume III
BASIC WEAPONS**

**PART ONE
RIFLE COMPANY**

**CHAPTER 1A
RIFLE MARKSMANSHIP
U. S. RIFLE, CALIBER .30, M1**



Digitized by Google

BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 1A RIFLE MARKSMANSHIP U. S. RIFLE, CALIBER .30, M1

**Prepared under direction of the
Chief of Infantry**



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1938**

For sale by the Superintendent of Documents, Washington, D. C. - Price 10 cents

WAR DEPARTMENT,

WASHINGTON, *January 3, 1938.*

Chapter 1A, Rifle Marksmanship, U. S. Rifle, Caliber .30, M1, Part One, Rifle Company, Basic Field Manual, Volume III, Basic Weapons, is published for the information and guidance of all concerned.

[A. G. 062.11 (5-5-37).]

BY ORDER OF THE SECRETARY OF WAR:

MALIN CRAIG,
Chief of Staff.

OFFICIAL:

E. T. CONLEY,
Major General,
The Adjutant General.

TABLE OF CONTENTS

SECTION I. General:	Paragraph	Page
Description of rifle.....	1	1
Rate of fire.....	2	1
Marksmanship course.....	3	1
SECTION II. Mechanical training:		
Object.....	4	2
When taken up.....	5	2
Organization.....	6	2
Methods of instruction.....	7	2
SECTION III. Preparatory marksmanship training:		
Object.....	8	3
When taken up.....	9	3
Use of dummy cartridges.....	10	3
Organization—duties of leaders.....	11	3
Equipment.....	12	4
Method of instruction.....	13	5
Duties of coaches.....	14	6
Preparatory exercises.....	15	6
First sighting and aiming exercises—sighting bar.....	16	6
Second sighting and aiming exercises—aligning bull's-eye and sights.....	17	7
Third sighting and aiming exercise—making triangles.....	18	8
Position exercises.....	19	9
Prone position.....	20	12
Sandbag rest position.....	21	13
Sitting position.....	22	13
Kneeling position.....	23	14
Standing position.....	24	14
Short skirmish run.....	25	15
Trigger-squeeze exercises.....	26	17
Time-fire exercises.....	27	17
Sight setting.....	28	18
Windage.....	29	18
Elevation.....	30	19
Explanation of zero.....	31	20
SECTION IV. Examination before proceeding to range practice:		
General.....	32	20
SECTION V. Courses to be fired:		
Scope and object of range practice.....	33	21
Marksmanship courses.....	34	22

TABLE OF CONTENTS

SECTION VI. Conduct of range practice:	Paragraph	Page
When taken up.....	35	29
Organization.....	36	30
Uniform.....	37	31
Use of dummy cartridges.....	38	31
Use of sandbag rest.....	39	32
Use of pads.....	40	32
Coaching.....	41	32
Zeroing the rifle.....	42	33
Instruction practice on the 1,000-inch range.....	43	34
Instruction practice on the known-distance range.....	44	35
Safety precautions.....	45	36
SECTION VII. Regulations governing record practice:		
General.....	46	37
Fire orders.....	47	38
Sequence of exercises.....	48	38
Examination of equipment.....	49	38
Stoppages.....	50	38
Men marking targets not to know who is firing.....	51	38
Target details.....	52	39
Organization of firing line.....	53	39
Score cards and scoring.....	54	40
Marking.....	55	41
Procedure in slow fire.....	56	41
Procedure for time fire and for time fire with the short skirmish run.....	57	42
Use of telephones.....	58	43
Coaching prohibited.....	59	44
Use of instruments.....	60	44
Shelter for firer.....	61	44
Restrictions as to the rifle.....	62	44
Trigger pull.....	63	44
Ammunition.....	64	45
Cleaning.....	65	45
Use of gun sling.....	66	45
Pads and gloves.....	67	45
Warming or fouling shots.....	68	45
Shots cutting edge of bull's-eye or line.....	69	45
Slow fire score interrupted.....	70	45
Misses.....	71	45
Shots to be included in score.....	72	45
Firing on wrong target.....	73	46
Two shots on same target.....	74	46
Withdrawing target prematurely.....	75	46
Unfired cartridges in time fire.....	76	46
More shots than prescribed in time fire.....	77	46
Record practice for course D, 1,000-inch range.....	78	46
SECTION VIII. Targets and ranges:		
Targets.....	79	48
Ranges.....	80	50

TABLE OF CONTENTS

SECTION IX. Advice to instructors:	Paragraph	Page
Provisions not mandatory.....	81	50
Units detailed to range.....	82	50
Place of assembly for instruction.....	83	51
Training of instructors.....	84	51
Inspection of equipment.....	85	51
Inspection of rifles.....	86	51
Ammunition.....	87	51
Organization of the work.....	88	51
Model schedules.....	89	53
SECTION X. Small-bore practice:		
Object.....	90	54
Value.....	91	55
Continuous small-bore practice.....	92	55
Firing.....	93	55
Courses to be fired.....	94	55

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 1A

RIFLE MARKSMANSHIP

U. S. RIFLE, CALIBER .30, M1

SECTION I

GENERAL

1. Description of rifle (S. N. L. B-21).—The U. S. rifle, caliber .30, M1, is a self-loading shoulder weapon. It is gas operated and clip fed. It weighs 9 pounds and the bayonet an additional pound. The ammunition is furnished in clips of 8 rounds which weigh 0.5 pound each.

2. Rate of fire.—The principal characteristic of this weapon is its mechanical operation which enables the individual rifleman or the group to deliver a large volume of accurate fire upon any designated point or area within range. The average soldier is capable of attaining a sustained cadence of fire of 30 shots per minute with this weapon. A higher rate is mechanically possible.

3. Marksmanship course.—*a. Purpose.*—The marksmanship course is designed to train each soldier to take full advantage of the weapon's characteristics.

b. Outline of training.—Training with the U. S. rifle, M1, is divided into the following phases:

(1) *Mechanical training and related subjects.*—As prescribed in S. N. L. B-21 and supplements.

(2) *Preparatory marksmanship training.*—As prescribed in section II.

(3) *1,000-inch range practice*.—As prescribed in sections V, VI, and VII.

(4) *Known-distance range practice*.—As prescribed in sections V, VI, and VII.

c. It is important that all officers and others charged with instruction become familiar with the provisions of this entire manual before undertaking any part of the instruction of personnel who are to fire.

SECTION II

MECHANICAL TRAINING

4. **Object.**—Mechanical training is designed to give the soldier training that will insure his ability to disassemble and assemble the rifle properly.

5. **When taken up.**—Mechanical training will be taken up in advance of preparatory marksmanship training (sec. III) or concurrently with such training. In either case it will be completed before 1,000-inch or known-distance firing is commenced. Instruction in the care and cleaning of the rifle will be covered during mechanical training. S. N. L. B-21 covers the details of mechanical training.

6. **Organization.**—In the company or platoon all enlisted men are combined in one or more groups under their officers or selected noncommissioned officers as instructors. Other noncommissioned officers supervise the work as directed. Corporals supervise the work of their squads.

7. **Methods of instruction.**—*a.* As a general rule instruction is so conducted as to insure the uniform progress of the platoon and company.

b. The instructor briefly explains the subject to be taken up and demonstrates it himself or with a trained assistant.

c. The instructor then causes one man in each squad or subgroup to perform the step while he again explains it.

d. The instructor next causes all members of the squads or subgroups to perform the step, checked by their noncommissioned officers. This is continued until all men are proficient in the particular operation, or until those whose progress is slow have been placed under special instructors.

e. Subsequent steps are taken up in like manner during the instruction period.

SECTION III

PREPARATORY MARKSMANSHIP TRAINING

8. Object.—This section is designed to provide a thorough course in preparatory marksmanship training.

9. When taken up.—Preparatory marksmanship training will be taken up in the period stated in training programs and will immediately precede range practice. For units of the Regular Army the period devoted to preparatory marksmanship training can be completed in five training days. For other components of the Army the periods devoted to preparatory marksmanship training will be of such duration and ordered at such times as may be best suited for effective training.

10. Use of dummy cartridges.—The use of dummy cartridges of any type is prohibited in preparatory marksmanship training. Experience gained with the U. S. rifle, M1, indicates that the use of dummy cartridges in the preparatory exercises will cause damage to the chambers and mechanisms of the rifles. An effective substitute procedure for the use of dummy cartridges in this instruction is given in paragraphs 26 *d* and 27 *c* (4).

11. Organization—duties of leaders.—*a. Battalion commander.*—Requires the officers and noncommissioned officers to be familiar with the prescribed methods of instruction and coaching; supervises the instruction within his battalion; and requires the companies to follow the preparatory exercises and methods of coaching carefully and in detail.

b. Company commander.—Requires the prescribed methods of instruction and coaching to be carried out carefully and in detail within his company; and supervises and directs the platoon leaders.

c. Platoon leader.—Supervises and directs the squad leaders in training their squads; examines each man in his platoon as required in section IV; and keeps a copy of the form shown in paragraph 32 *d* for each man and sees that it gives a careful and complete record of his work.

d. Sergeants.—Assist in the instruction and perform any other duties as directed by the company and platoon commanders. May assist the platoon leaders in keeping the forms referred to in *c* above.

e. Squad leader.—(1) Sees that each man in his squad is occupied in the designated preparatory training.

(2) Keeps up his own copy of the form shown in paragraph 32 *d* and promptly enters the grades made by his men as the work progresses. Has this form ready for the platoon leader's inspection at any time.

(3) Requires the coaches to correct errors.

12. Equipment.—*a. List of equipment for each squad.*

(1) Two sighting bars.

(2) Two rifle rests.

(3) Two 3-inch sighting disks.

(4) Four small aiming targets.

(5) One 10-inch sighting disk.

(6) Two small boxes.

(7) One target frame covered with blank paper for long-range triangles.

(8) One score book for each man.

(9) Two blank examination forms as shown in paragraph 32 *d*.

(10) One time-fire target with curtain for each three squads.

b. Preparation of equipment.—(1) *Sighting bar.*—Fabricate the sighting bars from trim lumber and tin strip to the dimensions and design shown in figure 1. The sighting bars, as all other equipment, should be constructed so as to present a neat appearance. The tops of the sighting bars, their front and rear sights, and their eyepieces are painted black.

(2) *Rifle rest.*—An empty ammunition box or any similar box with notches cut in the ends to fit the rifle closely makes a good rifle rest. The rifle is placed in these notches with the trigger guard just outside one end. The sling is loosened and pulled to one side. The box is half filled with earth or sand to give it stability.

(3) *Sighting disks.*—Sighting disks are of two sizes. The disk to be used at a distance of 50 feet is shown in figure 1. The disk to be used at 200 yards is 10 inches in diameter. It is painted black and attached to a 4-foot handle. The bull's-eyes of the sighting disks have holes through their centers of a size sufficient to admit a pencil point.

(4) *Blackening the sights.*—In the preparatory exercises which involve aiming, and in range firing, both sights of the

rifle should be blackened. A number of materials give a suitable flame for this purpose. Among the most commonly used are candles, camphor, small pine sticks, and carbide or kerosene lamps.

13. Method of instruction.—*a.* The principles of group instruction as described in paragraphs 6 and 7 are used for the necessary explanations and demonstrations. In the individual

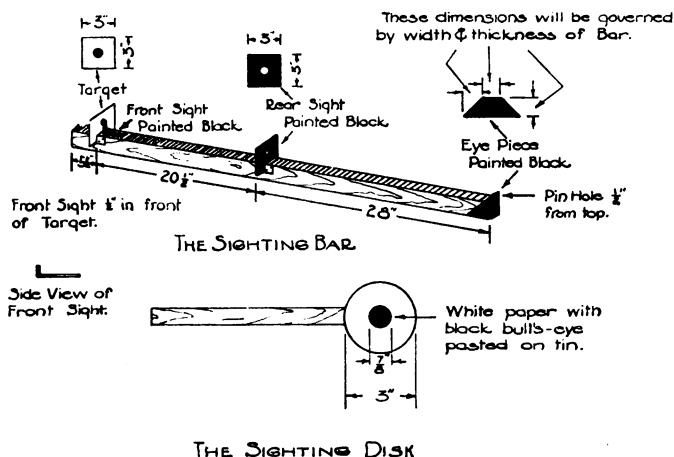


FIGURE 1.—Sighting bar and sighting disk.

performance required of the men in the preparatory exercises the coach-and-pupil system is used. In this the men are grouped in pairs, as coach and pupil, and are thus enabled to alternate in assisting and coaching each other.

b. Correct shooting habits should be acquired during the preparatory exercises, and to this end the careful execution of details must be required. Training should proceed expeditiously to maintain interest. Care will be taken to avoid holding the men in positions until they become uncomfortable and to give frequent short rests.

c. Arrangement should be made to enable officers to complete their own preparatory marksmanship training prior to that of

their men in order that they may give their entire attention to the men whom they are to direct and instruct.

14. Duties of coaches.—The successful conduct of the preparatory exercises largely depends upon the attention of the coaches to their duties. Officers and noncommissioned officers are specifically charged with the supervision of coaches as well as of pupils. They will require the coaches to have their pupils execute all steps of the preparatory exercises correctly. The duties of a coach are specific and during the progress of the preparatory exercises include necessary correction of the pupil to see that—

- a.* The gun sling is properly adjusted.
- b.* The position is taken correctly.
- c.* The slack is taken up promptly.
- d.* The aim is carefully taken.
- e.* The breath is held during aiming (by watching the pupil's back).
- f.* The trigger is squeezed properly.
- g.* The pupil calls the shot.

15. Preparatory exercises.—There are four progressive types of these exercises as follows:

- a.* The sighting and aiming exercises.
- b.* The position exercises.
- c.* The trigger-squeeze exercises.
- d.* The time-fire exercises.

16. First sighting and aiming exercises—sighting bar.—The instructor or squad leader shows a sighting bar to his group and explains its use as follows being careful to point out the various parts of the bar as he refers to them:

- a.* The front and rear sights on the sighting bar represent enlarged rifle sights.
- b.* The eyepiece on the sighting bar has no counterpart on the rifle. The eyepiece on the sighting bar is used as an aid to instruction because it enables the alinement of the sights to be demonstrated easily. The movable target on the sighting bar enables any alinement of the sight upon the bull's-eye to be shown.
- c.* The instructor or squad leader next explains the peep sight to his group and shows each man a correct sight alinement with the target removed. See figure 2.

d. The instructor or squad leader next describes the correct aim. He explains that the top of the front sight is centered in the rear sight so as just to touch the bottom of the bull's-eye.

e. The instructor or squad leader explains that the eye should be focused on the bull's-eye in aiming, and he assures himself by questioning the pupils that each man understands what this means.

f. The instructor or squad leader adjusts the sights of the sighting bar and the movable target so as to illustrate the correct aim and has each man observe it by looking through the eyepiece.

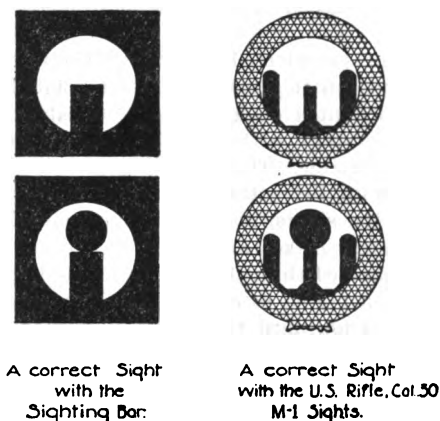


FIGURE 2.—Correct alinement of sights.

g. The instructor or squad leader adjusts the sights and the movable target of the sighting bar so as to illustrate various small errors and has each man of the group detect and describe them.

h. Each man will then again be shown the bar with the correct aim illustrated.

17. Second sighting and aiming exercises—alining bull's-eye and sights.—A rifle for each subgroup is placed in a rifle rest and pointed at a blank sheet of paper mounted on a box at which a soldier with the small disk is stationed as marker.

The coach or an instructor takes the prone position and without touching the rifle looks through the sights. He directs the marker to move the small disk until the bottom of the bull's-eye is in correct alinement with the sights. He then commands: **HOLD**, at which the marker will hold the small disk in position. The coach or instructor moves away from the rifle and directs the pupil to look through the sights in order to observe the correct aim. (See fig. 2.) He then requires the pupil to execute the exercise for himself being careful to check the alinement which the pupil obtains.

18. Third sighting and aiming exercise—making triangles.—*a.* The object of this exercise is to teach uniform and correct aiming.

b. The exercise is conducted as follows: The rifle with blackened sights is placed in a rifle rest and pointed at a blank sheet of paper mounted on a box 50 feet distant. The pupil takes the prone position without touching the rifle or rest and looks through the sights. The pupil directs the marker to move the small disk until the bottom of the bull's-eye is in correct alinement with the sights, and then commands: **MARK**. The marker immediately makes a dot on the paper with a sharp-pointed pencil inserted through the hole in the bull's-eye. The small disk is then moved to change the alinement. The pupil repeats this operation until three dots, numbered 1, 2, and 3, have been made. These dots outline the aiming group and the pupil's name is written under it. The size and shape of the aiming group will be discussed with the coach or instructor and the cause of error pointed out and corrected. This exercise is repeated until proficiency is attained. A good group of three marks can be covered by the eraser of an ordinary pencil.

c. A similar exercise should also be held during the period of preparatory marksmanship training at 200 yards with the 10-inch movable bull's-eye. If the exercise is properly handled, it helps greatly to sustain interest in the work and to teach correct aiming. At 200 yards a man should be able to make an aiming group that can be covered with the small sighting disk (3-inch diameter).

d. Tissue paper is used to copy each man's 200-yard aiming group. These tracings are marked with the men's names,

turned over to the platoon leader for his information, and shown to the men with appropriate mention of errors to be corrected.

e. The triangle exercises may be continued during the remaining periods of preparatory marksmanship training to maintain interest and to secure the proficiency of men who require special instruction.

19. Position exercises.—*a. General.*—Instruction in position will include the use of the gun sling, taking up the slack, holding the breath, and aiming in each position. Small targets should be set up for each position to assist the aim.

b. Scope of instruction.—Detailed instruction will be given in each of the positions described in paragraphs 20 to 25 inclusive.

c. General rules governing all positions.—(1) To assume any position, first half-face to the right and then assume the position.

(2) Upon assuming any position there is a point at which the rifle points naturally and without effort. If this point is not the center of the target, the whole body must be shifted so as to bring the target into proper alinement. It is important to pick out and allow for this natural pointing for the rifle in assuming any position rapidly.

(3) The right hand grasps the small of the stock. The right thumb may be either around the small of the stock or along the right side of the stock.

(4) The left hand is against or near the lower band, the rifle rests in the palm of the left hand.

(5) The left elbow is as nearly under the rifle as it can be placed without strain.

(6) The trigger is squeezed with the second joint of the index finger. The first joint may be used if necessary.

(7) The cheek is firmly pressed against the stock and placed as far forward as possible without strain to bring the eye near the rear sight.

(8) Left-handed men will be permitted to shoot in the left-handed position.

d. Gun sling.—(1) Each man will be assisted by the instructor in securing the correct adjustment for his sling. The

gun sling will be readjusted for close-order drill by means of the lower loop without changing the adjustment of the upper loop. The leather keepers will be adjusted habitually with one on each side of the upper frog. In a firing position the sling should be adjusted so as to give firm support without discomfort.

(2) Two adjustments of the sling are authorized; the loop sling and the hasty sling. The loop sling gives better support in time fire and in all positions, except standing, than does the hasty sling for the U. S. rifle M1.

(a) *Loop adjustment* (fig. 3).—Loosen the lower loop. Put the left arm through the upper loop from right to left so that the upper loop is near the shoulder and well above the biceps muscle. Tighten the loop on the upper arm by pulling down on the frog until it is in contact with the lower keeper. Pull the upper keeper down against the frog to hold the loop in place. The free end of the sling may be rolled up and placed between the upper and lower keepers for additional security. Move the left hand over the top of the gun sling and grasp the rifle near the lower band so as to cause the sling to lie smoothly along the hand and wrist. The lower loop is not used in this adjustment and must be loose to prevent tension.

(b) *Hasty sling adjustment*.—Loosen the lower loop. Grasp the rifle just in rear of the lower band with the left hand and grasp the small of the stock with the right hand. Throw the sling to the left and catch it above the elbow and high on the arm. Remove the left hand from the rifle, pass the left hand over the sling and into position under the forearm of the rifle. (See fig. 7.)

e. *Taking up the trigger slack*.—Taking up the slack in the trigger is part of each position exercise. This play must be taken up by the finger as soon as the correct position is assumed and just before the final aiming is commenced. The entire amount of slack is taken up by one light, firm pressure of the finger.

f. *Holding the breath*.—The breath should be held naturally during aiming. To accomplish this, draw a little more air into the lungs than is used in an ordinary breath. Let out a little of this air and hold the rest with the throat closed and with the stomach muscles relaxed.

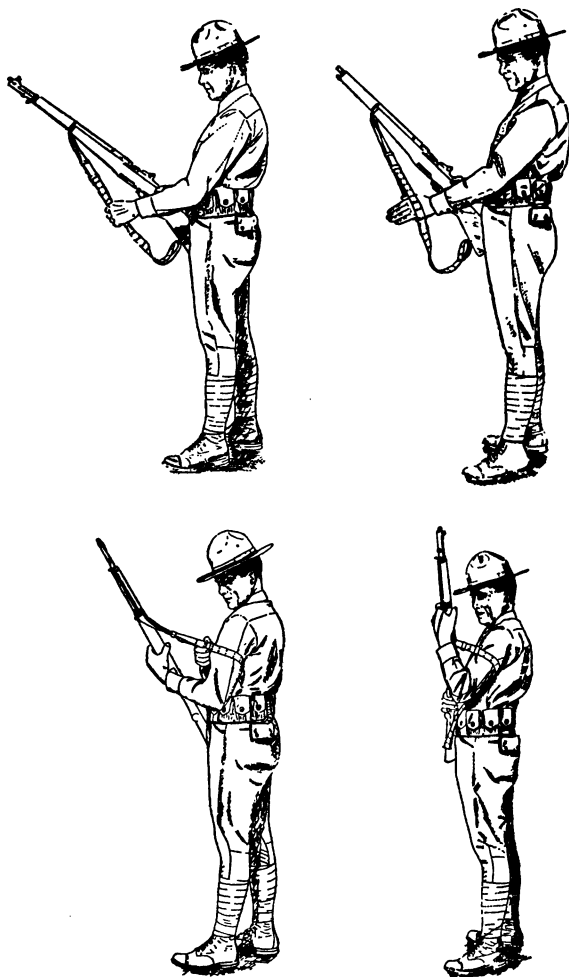


FIGURE 3.—Loop adjustment.

g. Aiming.—The rifle is carefully aimed in each position. The aiming device may be used by the coach to check the aim.

h. Canting the rifle.—In all positions the rifle should be squarely held, that is, not tipped or canted from a vertical plane passing through its long axis. It should be understood however, that unless it is pronounced, this error in position will not materially affect the aim nor the shot.

20. Prone position (fig. 4).—*a.* Body lying at an angle of 45° to the line of aim with the back straight; legs well apart; inside of the feet flat on the ground, or as nearly so as is possible

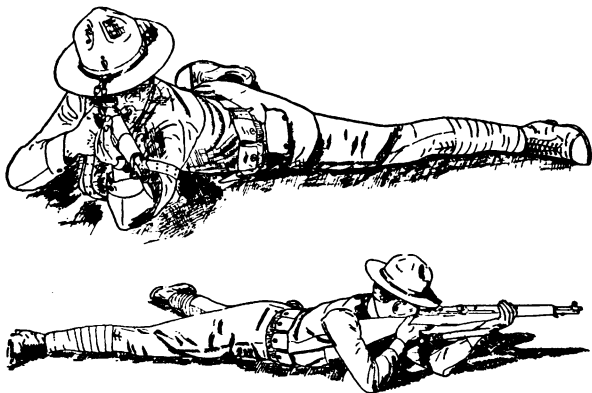


FIGURE 4.—Prone position.

without strain; elbows well under the body so that the chest is raised off the ground; right hand grasping the small of the stock; left hand near the lower band with the rifle resting on the palm of the hand; cheek pressed firmly against the stock with the eye as near the rear sight as it can be placed without strain. The exact details of the position will depend upon the conformation of the man but the elbows should not be unduly spread apart nor the left hand placed against or near the trigger guard.

b. The standing to prone position is assumed rapidly in accordance with the procedure given as a part of the short skirmish run in paragraph 25.

21. Sandbag rest position.—The sandbag rest position may be included in the position exercises. It conforms in every detail to the normal prone position except that the sling may be loosened slightly and the sandbag supports the left forearm, wrist, and hand. The bag is half filled with sand and tied near the top. The use of the sandbag in the first stages of a pupil's training is optional with the company or higher commander. In general the use of the sandbag is not necessary to teach correct shooting with the U. S. rifle, M1.

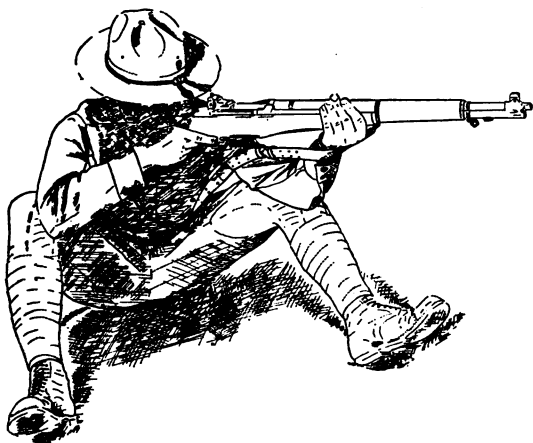


FIGURE 5.—Sitting position.

22. Sitting position (fig. 5).—*a.* The firer sits half-faced to the right; feet well apart and well braced on the heels which are slightly dug into the ground; body leaning well forward; both arms resting inside the legs and well braced; cheek pressed firmly against the stock and placed as far forward as possible without strain; left hand near the lower band with the rifle resting on the palm of the hand. In this position the feet may be slightly lower than the ground on which the firer sits. Necessary changes to adapt the position to the conformation of the man are authorized.

b. The standing to sitting position is rapidly assumed by breaking the fall with the right hand placed slightly to the rear of the position before it regrips the stock.

23. **Kneeling position (fig. 6).**—The firer kneels half-faced to the right on the right knee, sitting on the right heel; the left knee bent so that the lower left leg is vertical; left arm well under the rifle and resting on the left knee with the point of the elbow beyond the kneecap; right elbow approximately at the height of the shoulder; cheek pressed firmly



FIGURE 6.—Kneeling position.

against the stock and placed as far forward as possible without strain. Sitting on the side of the foot instead of the heel is authorized.

24. **Standing position (fig. 7).**—The firer stands half-faced to the right; feet 1 to 2 feet apart; body erect and well balanced; left elbow well under the rifle; rifle resting on the palm of the left hand in front of the balance; butt of the piece high up on the shoulder and firmly held; right elbow approximately at the height of the shoulder; cheek pressed firmly against the stock and placed as far forward as possible without strain. A position with the left hand against or under the trigger guard *is not a practical field position and is prohibited.*



FIGURE 7.—Standing position.

25. Short skirmish run.—*a.* The short skirmish run is included in marksmanship for the U. S. rifle, M1, to teach field firing. For this reason special preparation of the firing point for each man is prohibited. The firing points will be kept evenly graded but will not be otherwise prepared in advance for each firer.

b. The exercise commences with the men 25 yards (or other designated distance) behind the firing line and in the prone position shown in figure 8 *with the rifles unloaded*. At the command: 1. *Prepare to rush*, 2. *UP*, they rise and move forward at a run. Upon arrival at the firing point individuals rapidly assume the prone position as follows (fig. 8):

- (1) Bend both knees to the ground.
- (2) Place the butt of the rifle on the ground well ahead of the body.
- (3) Place the left elbow on the ground.
- (4) Load (or simulate loading) the rifle and set it at "Safe."

(5) Place the butt of the rifle against the right shoulder with the right hand.

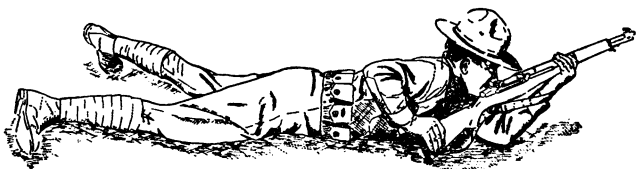
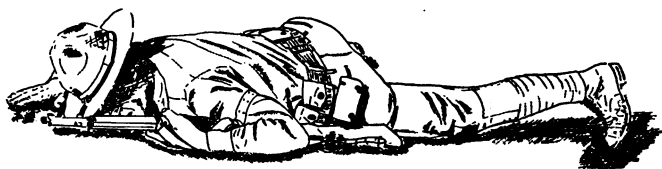


FIGURE 8.—Short skirmish run.

(6) Grasp the small of the stock with the right hand and lower the right elbow to the ground.

(7) Set the rifle at "Ready."

(8) Proceed with the aiming.

c. Other methods or necessary changes to adapt the above method of assuming the prone position to the conformation of the man are authorized.

d. Changes in the method of loading and the safety procedure prescribed above for skirmish runs are prohibited in marksmanship with the U. S. rifle, M1. The principle to be observed is that the individual does not load his rifle until he is in position on the firing line.

26. Trigger-squeeze exercises.—*a. General.*—In both slow and time fire it is important to squeeze the trigger in such a way as to fire the rifle without affecting the aim. The trigger must be squeezed so steadily that the firer does not know the exact instant at which the rifle will be fired. A good shot knows that he cannot get results by jerking the trigger at the exact moment at which the sights are alined on the mark. He therefore holds his aim as steadily as possible and increases the pressure on the trigger until the piece is fired. This method of squeezing the trigger must be carried out in all preparatory exercises or the value of the practice is lost.

b. Calling the shot.—The pupil must always notice where the sights are pointed at the instant the rifle is fired, or when the hammer falls in simulated fire, and call out *at once* where he thinks the bullet will hit. In time fire, he should call the last shot.

c. Scope of instruction.—(1) The pupil is first taught the trigger squeeze in the prone position. In this position he can hold steadily while he squeezes the trigger. After proficiency is obtained in the prone position the trigger squeeze will be practiced in the sitting, kneeling, and standing positions.

(2) In all exercises where fire is simulated, men will carry out the correct principles of aiming, squeezing the trigger, and calling the shot.

d. The coach will cock the piece for each trigger squeeze by pressing back on the operating handle in one firm movement, just far enough for the lugs on the hammer to engage the trigger lugs, but not far enough to hang the bolt open in rear of the follower. See figure 9.

27. Time-fire exercises.—*a. General.*—All the points learned in slow fire are carried out in time fire including the trigger squeeze.

b. Cadence.—The most important element of time-fire training is the development of cadence in firing. This natural rhythm of fire will vary from about 5 seconds per shot for the beginner to about 2 seconds per shot for the experienced man. In the early stages of training the coach and pupil should work together at a rate of 5 seconds per shot. During preparatory marksmanship this time interval will be gradually reduced to about 2 seconds per shot.



FIGURE 9.—Position of coach.

c. Scope of instruction.—(1) The instructor first assembles his group and explains and demonstrates the cadence of time fire.

(2) He next proceeds to its application requiring the coaches and pupils to start the exercises with a slow cadence and gradually increase the cadence as skill is attained until an approximate rate of 30 shots per minute is attained.

(3) The instructor in charge of the firing line gives the commands and the pupil executes them exactly as in time fire on the rifle range as described in section VI.

(4) Each time the pupil squeezes the trigger the coach promptly presses back the operating handle with a sharp motion and then releases the pressure to permit the operating handle to go forward. See figure 9.

(5) Time-fire exercises will be given in all positions and after the short skirmish run.

(6) Targets or aiming points will be used in all time-fire exercises. If practicable, some instruction will be given at 200 and 300 yards. Sights are set for the ranges which are used.

28. Sight setting.—*a.* Instruction or a review of sight setting as set forth in the following paragraphs of this section will be completed during the period devoted to preparatory marks-

manship training. Instruction or a review of the use of the score book in accordance with the instructions contained therein will be similarly completed. In connection with this subject those under instruction will be informed that care exercised in the required use of the score book during range practice will materially assist them in becoming qualified shots.

b. Practical instruction in sight setting and in keeping the score books may be given indoors or under shelter during inclement weather with such simple equipment as blackboards, targets, the rifles, score books, and pencils.

29. Windage.—*a. Direction of wind.*—The horizontal clock system is used to describe the direction of the wind. In this system the firer is assumed to be at the center of a clock and the target at 12 o'clock. A 3-o'clock wind then blows directly from the right, a 9-o'clock wind directly from the left, and other winds from their corresponding directions on the clock. Right windage is taken to counteract the effect of winds coming from the right of the clock and left windage to counteract those coming from the left. The amount of windage to allow for the first shot is shown by the windage diagram in the score book by substituting one "click" for each quarter point of windage there indicated. After the first shot is marked the necessary correction in windage to bring shots into the bull's-eye is found by reference to the ruled targets which are shown for each range in the score book.

b. *Effect of sunlight.*—Strong sunlight slanting on the front sight from either side affects the aim and hence the amount of windage to be taken. In allowing for this effect, which may vary from zero to several clicks, windage is taken toward the sun.

c. *Windage rule.*—One click of the windage knob moves the strike of the bullet 1 inch on the target for each 100 yards of range. Right windage moves the strike of the bullet to the right, and left windage moves it to the left as shown by the arrow and letters on the windage knob.

30. Elevation.—*a. Range.*—Changes in elevation are made on the sight of the rifle for the primary purpose of adjusting for range.

b. Effect of light.—Light has an effect upon aim, generally causing men to aim slightly lower in a poor light than in a good one. Slight corrections in elevation are therefore necessary at times for this reason.

c. Elevation rule.—One click of the elevating knob moves the strike of the bullet 1 inch on the target for each 100 yards of range. The strike of the bullet is moved “up” or “down” as shown by the arrow and words on the knob.

31. Explanation of zero.—*a.* An explanation of the zero of the rifle should be included in the instruction in sight setting. The zero of a rifle for any range is that sight setting, in elevation and windage, which will center the shot group in the target. It may vary for the same rifle with different men on account of differences in eyesight. Each man should understand this explanation of the zero of a rifle, and that he will be required to keep a record of the zeros for his own rifle in his score book.

b. Instructions for zeroing the rifle on the 1,000-inch range and on the known-distance range are given in section VI.

SECTION IV

EXAMINATION BEFORE PROCEEDING TO RANGE PRACTICE

32. General.—*a.* No man will be permitted to proceed to 1,000-inch or known-distance range practice until he has been examined to determine his proficiency in the subjects covered in sections I to III inclusive. During mobilization or other period of emergency, regimental or higher commanders are authorized to modify this requirement.

b. This examination should consist of questions designed to bring out the soldier's knowledge of the weapon and of demonstrations on his part of his practical ability in the subjects which have been covered.

c. Men may be required to disassemble and assemble the rifle, to clean the parts, to explain the functioning, to go through the service of the rifle, to apply immediate action to simulated stoppages and to explain them, and to demonstrate their proficiency in the preparatory exercises.

d. The form shown below will be completed for each individual who is to fire as an essential part of this examination.

Form showing state of instruction

Names	Disassembling and assembling	Care and cleaning of the rifle	Knowledge of functioning	Service of the rifle	Immediate action and stoppages	Sighting bar (1st S. A. exercise)	Aligning sights (2d S. A. exercise)	Making triangles (3d S. A. exercise)	Prone position	Sitting position	Kneeling position	Standing position	Short skirmish run	Trigger-squeeze exercise	Time-fire exercise	Taking windage	Taking elevation	Understanding of the zero of a rifle	Use of score book	Final grade
Brown.....																				
Jones.....																				
Smith.....																				
Knox.....																				

Fair:	X	Good:	X X	Very good:	X X X	Excellent:	X X X X	Excellent and has instructional ability:	X X X X
-------	--	-------	--	------------	--	------------	--	--	--

SECTION V

COURSES TO BE FIRED

33. Scope and object of range practice.—a. Range practice is divided into two phases:

- (1) 1,000-inch range practice.
- (2) Known-distance range practice.

b. Practice on the 1,000-inch range is included in all marksmanship courses to conserve time, ammunition, and troop labor during the range season. The 1,000-inch range provides a convenient, short-distance range whereon the soldier can receive training with service ammunition in the fundamentals of marksmanship. The targets for this range are designed to provide the classes of fixed, traversing, and searching fire required in field firing. In practice on this range the soldier's errors are readily detected and pointed out to him.

c. Firing on the known-distance range will complete the marksmanship training of the soldier. This firing bears an obvious relation to the use of the rifle in the field. Training on the known-distance range is necessary to teach sight adjustment to compensate for wind and light.

d. Sequence of firing.—All units will complete their 1,000-inch firing before proceeding to the firing on the known-distance range. The tables given in the courses (par. 34) should be fired in the general sequence in which they appear in each course. Variations may be made in the sequence prescribed within INSTRUCTION PRACTICE to take advantage of time, weather, and range facilities. Variations may be made in the sequence prescribed within RECORD PRACTICE for the same reasons. In no case will an individual's RECORD PRACTICE in a course be interspersed with his INSTRUCTION PRACTICE.

34. Marksmanship courses.—*a.* One of the following courses will be fired by each rifleman. The particular course to be fired will be designated by higher authority. (See AR 775-10.) The conduct and rules governing these courses are covered in sections VI and VII.

COURSE A
1,000-INCH RANGE
TO ZERO THE RIFLE

TABLE I

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	No limit.	{ 8 loaded singly.	{ No. 1 and No. 2, 1,000-inch target-----	{ 4 prone----- 4 kneeling-----	} Loop sling.

Note.—The rifle will be used as a single-loading weapon in firing table I.

INSTRUCTION PRACTICE

TABLE II.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	No limit.	8 (1 clip)----	No. 5 to No. 6, 1,000-inch target.	Prone-----	Loop sling. Traverse and search. 1 shot at each figure. Do.
1,000	do-----	do-----	No. 7 to No. 8, 1,000-inch target.	Kneeling-----	

TABLE III.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	<i>Seconds</i> 20 -----	4 -----	No. 1, 1,000-inch target.	Standing to prone.	Loop sling. Load full clip.
1,000	20 -----	4 -----	No. 2, 1,000-inch target.	Standing to sitting.	Loop sling.
1,000	20 -----	4 -----	No. 3, 1,000-inch target.	Standing to kneeling.	Loop sling. Load full clip.
1,000	60 -----	4 -----	No. 4, 1,000-inch target.	Standing -----	Hasty sling.
1,000	75 -----	16 (2 clips) ---	No. 5 to No. 6, 1,000-inch target.	Prone to prone, rush 25 yards.	Loop sling. Traverse and search. 2 shots at each figure.
1,000	40 -----	8 (1 clip) ----	No. 7 to No. 8, 1,000-inch target.	Prone to kneeling, rush 25 yards.	Loop sling. Traverse and search. 1 shot at each figure.

NOTE.—Tables I and II should be completed on 1 target by each man during 1 period on the firing line. When all orders have fired tables I and II, the work should proceed to table III.

KNOWN-DISTANCE RANGE

INSTRUCTION PRACTICE

TABLE IV.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	No limit.	8 (1 clip) ---	Rifle D -----	{ 4 prone. Mark each shot. 4 standing. Mark each shot.	Loop sling. Hasty sling.
200	do -----	do -----	do -----	Prone to kneeling, rush 25 yards. All shots fired before target is withdrawn.	Loop sling.
300	do -----	do -----	do -----	{ 4 prone. Mark each shot. 4 kneeling. Mark each shot.	Do.
300	do -----	do -----	do -----	Prone to prone, rush 25 yards. All shots are fired before the target is withdrawn.	Do.
500	do -----	do -----	do -----	Prone. Mark each shot.	Do.

TABLE V.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	<i>Seconds</i> 60-----	16 (2 clips)---	Rifle D-----	Prone to kneeling, rush 25 yards.	Loop sling.
300	60-----	-----do-----	-----do-----	Prone to prone, rush 25 yards.	Do.

RECORD PRACTICE

TABLE VI.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	No limit.	4-----	Rifle D-----	Standing. Mark each shot.	Hasty sling. Load shots singly.
300	---do---	4-----	-----do-----	Kneeling. Mark each shot.	Loop sling Load shots singly.
500	---do---	4-----	-----do-----	Prone. Mark each shot.	Do.

TABLE VII.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	<i>Seconds</i> 60-----	16 (2 clips)---	Rifle D-----	Prone to kneeling, rush 25 yards.	Loop sling.
300	60-----	-----do-----	-----do-----	Prone to prone, rush 25 yards.	Do.

COURSE B

1,000-INCH RANGE

Fire tables I, II, and III of course A

KNOWN-DISTANCE RANGE

INSTRUCTION PRACTICE

TABLE VIII.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i>					
200.....	No limit.	4.....	Rifle D.....	Kneeling. Mark each shot.	Loop sling. Load shots singly.
200.....	do.....	8 (1 clip).....	do.....	Prone to kneeling, rush 25 yards. All shots fired before target is withdrawn.	Loop sling.
300.....	do.....	4.....	do.....	Prone. Mark each shot.	Loop sling. Load shots singly.
300.....	do.....	8 (1 clip).....	do.....	Prone to prone, rush 25 yards. All shots to be fired before target is withdrawn.	Loop sling.

TABLE IX.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i>	<i>Seconds</i>				
200.....	60.....	16 (2 clips).....	Rifle D.....	Prone to kneeling, rush 25 yards.	Loop sling.
300.....	60.....	do.....	do.....	Prone to prone, rush 25 yards.	Do.

RECORD PRACTICE

TABLE X.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	No limit	4.....	Rifle D.....	Kneeling. Mark each shot.	Loop sling. Load shots singly.
300	do.....	4.....	do.....	Prone. Mark each shot.	Do.

TABLE XI.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	<i>Seconds</i> 60.....	16 (2 clips) ..	Rifle D.....	Prone to kneeling, rush 25 yards.	Loop sling.
300	60.....	do.....	do.....	Prone to prone, rush 25 yards.	Do.

COURSE C

1,000-INCH RANGE

Fire tables I, II, and III of course A

KNOWN-DISTANCE RANGE

INSTRUCTION PRACTICE

TABLE XII.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200.....	No limit	4.....	Rifle D.....	Kneeling. Mark each shot.	Loop sling. Load shots singly.
200.....	do.....	8 (1 clip) ..	do.....	Prone to prone, rush 25 yards. All shots fired before target is withdrawn.	Loop sling.
200.....	do.....	do.....	do.....	Prone to kneeling, rush 25 yards. All shots fired before target is withdrawn.	Do.

TABLE XIII.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200.....	<i>Seconds</i> 60.....	16 (2 clips) ..	Rifle D.....	Prone to prone, rush 25 yards.	Loop sling.
200.....	27.....	8 (1 clip).....	do.....	Prone to kneeling, rush 25 yards.	Do.

RECORD PRACTICE

TABLE XIV.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	No limit.	4.....	Rifle D.....	Kneeling. Mark each shot.	Loop sling. Load shots singly.

TABLE XV.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 200	<i>Seconds</i> 60.....	16 (2 clips) ..	Rifle D.....	Prone to prone, rush 25 yards.	Loop sling.
200	27.....	8 (1 clip).....	do.....	Prone to kneeling, rush 25 yards.	Do.

COURSE D

1,000-INCH RANGE

TO ZERO THE RIFLE

TABLE XVI

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	No limit..	4 loaded singly.	Nos. 1 and 2, 1,000- inch target.	Prone.....	Loop sling.

NOTE.—The rifle will be used as a single-loading weapon in firing table XVI.

INSTRUCTION PRACTICE

TABLE XVII.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	No limit	8 (1 clip)	Nos. 5 to 6, 1,000-inch target.	Prone	Traverse and search. 1 shot at each figure. Loop sling. Do.
1,000	do	do	Nos. 7 to 8, 1,000-inch target.	Kneeling	

NOTE.—Tables XVI and XVII should be completed on 1 target by each man during 1 period on the firing line. When all orders have fired tables XVI and XVII the work should proceed to table XVIII.

TABLE XVIII.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	<i>Seconds</i> 50	8 (1 clip)	No. 5 to No. 6, 1,000-inch target.	Prone to prone, rush 25 yards.	Traverse and search. 1 shot at each figure. Loop sling. Do.
1,000	50	do	No. 7 to No. 8, 1,000-inch target.	Prone to kneeling, rush 25 yards.	

TABLE XIX.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	<i>Seconds</i> 20	4	No. 1, 1,000-inch target.	Standing to prone.	Loop sling. Load full clip. Loop sling.
1,000	20	4	No. 2, 1,000-inch target.	Standing to kneeling.	
1,000	75	16 (2 clips)	No. 5 to No. 6, 1,000-inch target.	Prone to prone, rush 25 yards.	Do.
1,000	40	8 (1 clip)	No. 7 to No. 8, 1,000-inch target.	Prone to kneeling, rush 25 yards.	Do.

RECORD PRACTICE

TABLE XX

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	<i>Seconds</i> 20.....	4.....	No. 1, 1,000-inch target.	Standing to prone.	Loop sling. Load full clip.
1,000	20.....	4.....	No. 2, 1000-inch target.	Standing to kneeling.	Loop sling.
1,000	75.....	16 (2 clips) ..	No. 5 to No. 6, 1,000-inch target.	Prone to prone, rush 25 yards.	Do.
1,000	40.....	8 (1 clip)	No. 7 to No. 8, 1,000-inch target.	Prone to kneeling, rush 25 yards.	Do.

b. For all exercises involving a rush of 25 yards to the firing line, if the full distance is not available, 2 seconds will be deducted from the time allotted for the exercise for each 5-yard reduction in the length of the rush. It should be noted that the natural cadence of fire for the U. S. rifle, M1, is the same in all positions.

c. The following shows the ammunition requirements and the possible scores for the various courses :

	Ammuni- tion	Possible score
Course:		
A.....	180	220
B.....	160	200
C.....	136	140
D.....	100	160

SECTION VI

CONDUCT OF RANGE PRACTICE

35. When taken up.—a. *Range practice.*—Training programs and schedules will provide a period for range practice.

b. Range practice, including both the 1,000-inch firing and the known-distance firing of any course, can be completed within a period equal to 10 training days by Regular Army units and,

except under exceptional circumstances, such period should not be exceeded. Range practice for units of other components of the Army will be of such duration and ordered at such times as may be best suited for effective training.

c. Supplementary range practice.—Supplementary range practice may be authorized for organizations which receive a large number of uninstructed men after the regular season. Supplementary range practice should generally be taken up as late in the fall as practicable. The mission of this practice is to prepare men for combat firing.

d. Officers' range practice.—The officers of an organization should be enabled to complete their own range practice in advance of their men whenever practicable in order that their entire attention may be given to their instructional duties. This applies particularly to mobilization training.

e. Continuous practice.—Rifle practice is not limited to a particular season. Subject to ammunition allowances, commanding officers will adopt such measures as may be necessary to maintain a high state of excellence in rifle firing throughout the year. The particular measures adopted will depend upon the facilities near the post or station. The measures taken may provide for competitions between individuals or organizations or the encouragement of small-bore teams.

f. Recruit instruction.—Training programs for recruits will include progressive instruction in rifle marksmanship as covered in the successive sections of this manual. If practicable, it will include a limited amount of rifle practice on the 1,000-inch or known-distance ranges and may be supplemented by small-bore practice.

36. Organization.—*a. Officer in charge of firing.*—An officer in charge of firing will be designated by the responsible commander. It is desirable that he be the senior officer of the largest organization occupying the range. The officer in charge of firing, or his deputy, will be present during all firing and will be in charge of the practice and safety precautions on the range.

b. The officers, noncommissioned officers, and coaches of the units on the range will perform duties generally similar to those prescribed for them in preparatory marksmanship instruction. See section III.

c. Range officer.—A range officer with such commissioned and enlisted assistants as are necessary will be appointed well in advance of range practice. At large camps or stations where the coordination of range practice for different organizations is involved, he may function as the direct representative of the camp or station commander. In other cases he should be made responsible to the officer in charge of firing and in all cases should cooperate closely with him. The range officer will make timely estimates for material and labor to place the range in proper condition for range practice, and will supervise and direct all necessary repairs to shelters, butts, targets, firing points, and telephone lines. He exercises direct supervision over the practical operation of the rifle range during the practice season. He regulates the distribution of ranges and targets and, in general, assists the officer in charge of firing by using the means necessary to secure efficient and accurate service from the working force of the range. He provides safe conditions for the markers and any visitors. When necessary, he provides range guards and instructs them in the methods to be used for the protection of life and property in the danger area.

d. Pit detail.—An officer or noncommissioned officer with such assistants as may be necessary will be detailed in charge of arrangements in the pit. He will be responsible to the officer in charge of firing for the discipline, efficiency, and safety of all pit details. He sees that all of the target equipment is kept in serviceable condition; that the desired targets are ready for firing at the appointed time; and that all target details are provided with the proper flags, marking disks, paste, pasters, and spotters.

37. Uniform.—The uniform to be worn during instruction practice and record practice will be prescribed by the commanding officer. The cartridge belt will be worn during instruction practice and record practice.

38. Use of dummy cartridges.—The use of dummy cartridges of any type is prohibited in range practice. Experience gained with the U. S. rifle, M1, indicates that the use of dummy cartridges in this training will cause damage to the chambers and mechanisms of the rifles. An effective substitute procedure for the use of dummy cartridges on the range is given in paragraph 41.

39. Use of sandbag rest.—The sandbag rest may be used in the early stages of a pupil's range practice as prescribed in paragraph 21. Its use on the range is to facilitate instruction in squeezing the trigger, not in holding.

40. Use of pads.—The use of elbow pads is recommended. The use of shoulder pads has been found unnecessary with the U. S. rifle, M1, but is permitted.

41. Coaching.—*a. General.*—(1) During instruction practice each man on the firing line will have a coach to watch him and to help him correct his errors. This statement does not mean that each man must have an old or experienced shot beside him. Any man of good intelligence who has been properly instructed in the preparatory work or who has been given instruction in coaching methods can be used with good results and should be used when more experienced coaches are not available.

(2) It is a good practice to have experienced coaches in charge of one or more targets, usually on a flank, to which particularly difficult pupils are sent for special coaching.

(3) Great patience should be exercised by the coach so as not to excite or confuse the firer. Everything should be done to encourage him. It is often a good plan to change coaches. It is necessary to do so if the coach shows signs of impatience.

b. Position of coach.—The coach will take the same position as the man who is firing, prone, sitting, kneeling, or standing, so as to be able to watch his trigger finger and his eye and so as to be able to press the operating handle to the rear for all rapid-fire exercises and yet be out of the line of the ejected cartridge cases.

c. Watching the eye.—Errors in trigger squeeze are ascertained by the coach by watching the pupil's eye. If the pupil's eye can be seen to close as the rifle goes off, it is because he anticipates the discharge and is not squeezing the trigger properly.

d. Substitute for dummy cartridges.—If special training is needed to correct the error described in *c* above, the coach should have the firer turn his head aside and, by depressing the top cartridge in the clip, permit the bolt to go home on an empty chamber, so that the pupil will not know whether the rifle is loaded or unloaded the next time he squeezes the trigger. If repetition is necessary coaches should go through the same

procedure, but allow a cartridge to be chambered occasionally. To demonstrate to individuals the results of correct trigger squeeze it may be necessary for the coach to "squeeze off" a few shots.

e. Coach squeezing the trigger.—(1) To squeeze the trigger for the firer the coach places his thumb against the trigger and his first finger against the back of the trigger guard. In this way he can apply pressure to the trigger by a pinching action of his thumb and first finger.

(2) The coach then watches the firer's back and between 5 and 10 seconds after the firer begins to hold his breath he applies enough pressure to discharge the piece. Shots fired in this way are almost always accurately placed.

42. Zeroing the rifle.—Each rifle will be "zeroed" for the 1,000-inch range in the firing provided for that purpose. Each rifle will be "zeroed" for 200, 300, and 500 yards during the instruction practice provided for those ranges. Each man will keep a record of these zeros in his score book.

a. To zero the rifle for the 1,000-inch range.—(1) The target for the 1,000-inch range is so designed that when aim is accurately taken at 6 o'clock on a black silhouette, the center of a shot group should be in the center of the same silhouette.

(2) To zero the rifle for this target take a steady aim in the prone position at 6 o'clock on the black silhouette of figure 1. The first shot is fired with a sight setting of 200 yards elevation and zero windage. Corrections in elevation and windage to bring subsequent shots into the center of the black silhouette are set in "clicks" by the elevating and windage knobs. Such corrections are applied *after every two or more shots* under the direction of an instructor. If the visibility of the shot groups is limited, the instructor, after taking necessary safety precautions, may move along the line of targets and announce the corrections to the coaches in terms of "clicks." One "click" equals approximately $\frac{1}{4}$ inch on the target on the 1,000-inch range.

b. To zero the rifle for the known-distance ranges.—(1) *General.*—The position of the spotters on the target will permit the necessary corrections in elevation and windage to be computed by the elevating and windage rules. They are then applied as

clicks to the sight. These sight settings should be made under the supervision of an instructor or experienced coach *after groups of two or more shots are fired.*

(2) *To zero the rifle at 200 yards.*—(a) Set the elevation at 200 and the windage at 0 in the normal manner prescribed in paragraph 13, section III, S. N. L. B-21. Fire a group of two or more shots and apply corrections in elevation and windage to bring the center of the next shot group or groups into the center of the black silhouette 7 inches above its bottom. Do not change the sight setting which obtains this result.

(b) Being careful not to disturb the above sight setting, loosen the screw in the elevating knob with the screw driver blade of the combination tool. Pull the elevating knob away from the receiver *until its teeth are completely disengaged* and then set the 200-yard mark on the drum exactly opposite the index line on the sight base.

(c) Tighten the screw. The rifle now has its sight set exactly at 200 yards elevation and is also correctly zeroed for 200 yards in elevation. Record the windage correction in the score book. Unless the rifle is subjected to especially hard usage the sight setting of exactly 200 will in future be the zero elevation for that range. Minor adjustments in elevation to compensate for light on different days may be applied as clicks. These should be recorded in the score book.

(3) *To zero the rifle at other ranges.*—Once the rifle has been zeroed for 200 yards as described in (2) above, it is easily zeroed for the other ranges as follows: Set the elevation at the desired range in the normal manner prescribed in paragraph 13, section III, S. N. L. B-21. Set the windage at 0. *Fire a group of two or more shots.* Then apply corrections in clicks of elevation and windage to bring the center of the shot group into the center of the target. Record these corrections in the score book as the zero for that range.

43. Instruction practice on the 1,000-inch range.—*a.* Instruction practice on the 1,000-inch range will conform to the regulations given in section VII for record practice except that coaching is permitted and additional personnel to score targets are not required.

b. Each exercise on the 1,000-inch range will be preceded by an appropriate fire order.

c. Form of fire order for slow or time fire, 1,000-inch range.

- (1) **Announce the position and number of rounds to be fired.**
- (2) **Slow (time) fire, figure 1 (or traverse figures 5 to 6).**
- (3) **With ball cartridges, LOAD (LOAD SINGLE SHOTS).**
- (4) **COMMENCE FIRING.**
- (5) **CEASE FIRING.**
- (6) **CLEAR GUN.**

d. Form of fire order for the short skirmish run, 1,000-inch range.

- (1) **Prone to prone (kneeling).**
- (2) **16 (8) rounds, traverse figures 7 to 8.**
- (3) **Prepare to rush, UP.**
- (4) **CEASE FIRING.**
- (5) **CLEAR GUN.**

NOTE.—The exercise starts with the men in the prone position 25 yards (or at the designated distance) behind the firing line with the loop slings adjusted and their ammunition *in their belts*. Rifles are loaded individually after the men are in the prescribed position on the firing line.

e. If the 1,000-inch range is equipped with pits and sliding targets similar to those of a known-distance range, the fire orders for time fire and for the short skirmish run prescribed for the known-distance range under paragraph 44 apply.

44. Instruction practice on the known-distance range.—a. Instruction practice is carried out in conformity with the regulations governing record practice, except that additional personnel for scoring targets are not required and each firer will have a coach with him on the firing line. At the discretion of the officer in charge of firing, instruction practice prescribed for 200, 300, and 500 yards in the several tables may be fired without changing ranges.

b. Each exercise on the known-distance range will be preceded by an appropriate fire order.

c. Form of fire order for slow fire, the known-distance range.

- (1) **Announce the position and number of rounds to be fired.**
- (2) **With ball cartridges, LOAD (LOAD SINGLE SHOTS).**
- (3) **Slow fire, target at 200.**
- (4) **COMMENCE FIRING.**
- (5) **CEASE FIRING.**

(6) **CLEAR GUN.**

d. Form of fire order for the short skirmish run, the known-distance range.

(1) **Prone to prone (kneeling).**

(2) **16 (8) rounds, time fire, targets at 300.**

(3) **Ready on the right?**

(4) **Ready on the left?**

(5) **READY ON THE FIRING LINE.**

(6) **Prepare to rush, UP.**

(7) **CEASE FIRING.**

(8) **CLEAR GUN.**

NOTE.—The exercise starts with the men in the prone position 25 yards (or at the designated distance) behind the firing line with the loop slings adjusted and their ammunition *in their belts*. Rifles are loaded individually after the men are in the prescribed position on the firing line.

The targets are withdrawn before the exercise starts and the red flag displayed at the center target. The command **Ready on the firing line** is transmitted to the officer or noncommissioned officer in charge in the pits who will have the red flag waved and lowered on its receipt and who will cause the targets to be run up simultaneously 5 seconds later. Upon the expiration of the proper time interval he causes the targets to be withdrawn. The officer in charge of the firing line watches the targets and gives the command **Prepare to rush** as the red flag is withdrawn. As the targets appear he commands **Up** and gives the command **Cease firing** when they are withdrawn.

45. Safety precautions.—All individuals who are to fire or who are concerned with range practice will be familiarized with the following safety precautions before firing is commenced:

a. Firing will not begin on any range until the officer in charge of firing has ascertained that the range is clear, and has given the commands **Load** and **Commence firing**.

b. At least one officer will be present at all firing.

c. All rifles on the range except those in use on the firing line will be *clear* with bolts open at all times. Rifles on the firing line will not be loaded without command.

d. No rifle will be removed from the firing line until an officer has inspected it to see that it is *clear* and the bolt *open*.

c. No person will be allowed in front of the firing line for any purpose until directed by an officer, who has ordered all rifles to be cleared and ascertained that the order has been carried out.

f. Danger flags will be displayed at prominent positions on the range during firing.

g. Care should be taken to avoid undue exposure of ammunition to the direct rays of the sun.

h. All firing will immediately cease and rifles set at "Safe" (or cleared if ordered) at the command *Cease firing*.

i. If a misfire occurs the piece will be cocked by the use of the trigger guard and an attempt made to refire.

j. Cartridges will not be left chambered in hot barrels.

k. All loading and unloading will be executed on the firing line with the muzzles directed toward the targets. Rifles will *never* be loaded *in rear* of the firing line. Loaded rifles will be set at "Safe" until the moment for firing.

l. Rifles will not be loaded for the short skirmish run until the firers are in position on the firing line. Firers will start from the prone position with their ammunition *in their belts*.

m. Upon arrival at the range the rifles of an organization will be inspected by the officers to see that chambers and barrels are free from obstruction and that all bolts are opened.

n. Before leaving the range all rifles and belts will be inspected by the company officers to see that they do not contain ammunition; and men in ranks will be questioned as to whether they have any ammunition in their possession.

SECTION VII

REGULATIONS GOVERNING RECORD PRACTICE

46. General.—*a.* Record practice for course A, B, or C is fired on the known-distance range. Record practice for course D is fired on the 1,000-inch range. Additional provisions applicable to record practice for course D are given in paragraph 78.

b. Record practice will follow instruction practice.

c. When the record practice of an individual has commenced it will be completed without interruption by any other form

of firing. Instruction practice and record practice will not be conducted on adjoining parts of the firing line.

d. The officer in charge of firing may, at his discretion, require record practice upon the day on which instruction practice is completed.

47. Fire orders.—Every exercise fired in record practice will be preceded by an appropriate fire order. Suitable forms for such orders are given in section VI.

48. Sequence of exercises.—The exercises given in the tables for record practice will be fired in the sequence directed by the officer in charge of firing. They should be fired with as little delay between exercises as is possible.

49. Examination of equipment.—Each firer will be held responsible that the rifle and ammunition which he brings to the firing line are in good order. Time will not be allowed for the examination of equipment on the firing line except in cases where it is necessary to fire the same rifle in consecutive orders.

50. Stoppages.—*a.* In the event of a stoppage during time fire, an officer will investigate the stoppage and authorize the score to be fired again if the stoppage is not due to a fault of the firer.

b. If the stoppage is manifestly due to failure on the part of the firer to inspect the rifle, sights, the clips of ammunition, or if it is due to incorrect loading of ammunition in the clips, or to incorrect loading of clips into the receiver, the firer will not be allowed to complete the exercise. In such case, only that part of the exercise which was fired will be scored.

c. Should a breakage occur the rifle will be repaired, or a different rifle substituted. If a different rifle is substituted the firer will then be allowed four extra rounds to determine the zero of the substituted rifle. He will then refire the exercise.

d. The officer in charge or his assistants will render all decisions on stoppages.

51. Men marking targets not to know who is firing.—Officers and men in the pit will not know who is firing on any particular target. Violations of this regulation will be made the subject of disciplinary action by the proper authority. In

case of such violation the firer will be required to repeat his score.

52. Target details.—The details in the pits for the supervision, operation, marking, and scoring of targets during record practice consist of officers, noncommissioned officers, and privates as follows:

a. One commissioned officer assigned to each two targets. When it is impracticable to detail one officer to each two targets in the pit, an officer will be assigned to supervise the marking and scoring of not to exceed four targets. In this case the pit scores will be kept by the noncommissioned officer in charge of each target who will sign the score cards. The officer will take up and sign each score card as soon as the complete score is recorded.

b. One noncommissioned officer assigned to each target to direct and supervise the markers. This noncommissioned officer will be selected, except at 1-company posts, from an organization other than the one firing on the target which he supervises. When a post is garrisoned by a single company so that it is impossible to detail noncommissioned officers of other companies to supervise the marking and scoring, these duties will be performed by noncommissioned officers of the firing company. In record firing at such post, new paper targets will be used for each day's firing. At the end of the day the company commander or one of his lieutenants will count the number of hits made in each division of the target and compare the totals with the recorded scores. Since the markers may inadvertently make errors in signaling hits, the record should be permitted to stand whenever an examination of the target gives results very closely agreeing with the recorded scores, but the markers should be cautioned to exercise greater care in the future. When there is more than one officer with the company, one will be in the pit during the record firing.

c. One or two privates assigned to operate and mark each target. These privates may be from the organization firing on the target to which they are assigned.

53. Organization of firing line.—*a.* Scorers seated close to and to the right rear of the person firing.

b. Telephone operators 5 paces in rear of the firing line.

c. Persons awaiting their turn to fire 10 paces in rear of the firing line.

d. Low arm racks or rifle racks and cleaning racks 20 paces in rear of the firing line.

e. During the firing of the skirmish run the distances given under *a*, *b*, *c*, and *d* above, will be measured from a line 25 yards in rear of the firing point.

54. Score cards and scoring.—*a*. Duplicate score cards will be kept, one at the firing line and one in the pit. These cards will be of different colors. The cards at the firing line will bear the date, the man's name, the number of the target, and the order of firing. The pit card will not show the man's name, but will bear the date, the number of the target, and the order firing.

b. Entries on all score cards will be made in ink or with indelible pencil. No alterations or corrections will be made on the card except by the organization commander who will initial each such alteration or erasure made.

c. The scores at each firing point will be kept by a noncommissioned officer of some organization other than that firing on the target to which he is assigned, except in the case of a one-company garrison when company officers will exercise special care to insure correct scoring. As soon as the score is completed the score card will be signed by the scorer, taken up and signed by the officer supervising the scoring, and turned over to the organization commander. Except when required for new scores on the range, score cards will be retained in the personal possession of the organization commander and not allowed in the hands of an enlisted man from the beginning of record practice until the required reports of range practice have been rendered.

d. In the pit the officer keeps the scores for the targets to which he is assigned. As soon as the score is completed he signs the score card. He turns these cards over to the organization commander at the end of the day's firing. The organization commander will check the pit records against the firing-line records. In case of discrepancy between the two the pit record governs.

e. Upon completion of the record firing and after the qualification order is issued, the pit scores of each man will be at-

tached to his official score card kept at the firing point. These cards will be kept available for inspection among the company records for 1 year and then destroyed.

55. Marking.—*a. Slow fire.*—(1) The value of the shot is indicated as follows:

- (a) A five with a white disk.
- (b) A four with a red disk.
- (c) A three with a black and white disk.
- (d) A two with a black disk.
- (e) A miss by waving a red flag across the front of the target.
- (f) Ricochet hits will not be counted nor indicated.

(2) The exact location of the hit is indicated by placing in the shot hole a spotter of a size appropriate to the distance from the firing line. The center of the marking disk is placed over the spotter in marking hits.

b. Time fire.—(1) The same disks are used to indicate the value of the hits as in slow fire.

(2) Spotters are placed in all shot holes before running the target up for marking.

(3) The marking begins with the hits of the highest value, the center of the disk being placed over the spotter, then swung off the target and back again to the next spotter, care being taken each time to show only the face of the disk indicating the value of the hit being marked. The marking will be slow enough to avoid confusing the scorer at the firing point. When one spotter covers more than one shot hole the disk is placed over it the required number of times. Misses are indicated by slowly waving the red flag across the face of the target one time for each miss. Ricochet hits will not be counted.

56. Procedure in slow fire.—*a. On the firing line.*—(1) One person will be assigned to each target in each order.

(2) As the value of each shot is signaled, the scorer announces the following in a tone sufficiently loud to be heard by the firer: The name of the firer, the number of the shot, and the value of the hit. The scorer then records the value of the hit on the score card of the individual who is firing.

(3) Whenever a target is marked without the individual assigned to that target having fired, as will occur when someone fires on the wrong target, the scorer will notify the officer in

charge, who will notify the officer assigned to the target in the pit to disregard that shot. This precaution is necessary to prevent errors in the pit record.

(4) When an individual fires on the wrong target he will not be assigned a miss until the target to which he is assigned has been pulled down and the miss signaled from the pit.

(5) If the target is not half-masked at the completion of a score on that target, or if it is half-masked at the wrong time, the officer in charge of that firing point will adjust the matter at once over the telephone. This precaution is necessary to prevent the error from being carried on through the scores that follow.

b. In the pit.—(1) The target is withdrawn and marked after each shot.

(2) When a shot is fired at a target, it is pulled down. The noncommissioned officer indicates the location of the hit to the officer who announces its value and records it on the score card. A spotter is then placed in the shot hole, the previous shot hole, if any, is pasted and the target is run up and marked. The noncommissioned officer supervises the marking of each shot. The officer also exercises general supervision over the marking.

(3) When the pit score card indicates a score has been completed, the target is half-masked for about 30 seconds as a signal to the firing line of such a completion. At the end of the 30 seconds the target is pulled fully down, the spotter removed, the shot hole pasted, and the target run up for the beginning of a new score.

(4) When a target frame is used as a counterweight for a double sliding target, the blank side of such frame will be toward the firing line.

57. Procedure for time fire and for time fire with the short skirmish run.—*a. On the firing line.*—(1) One person only will be assigned to a target in each order.

(2) When all is ready in the pit the red flag is displayed at the center target. At that signal the officer in charge of the firing line will conduct the exercise to be fired in accordance with the procedure given in section VI.

(3) If any individual fails to fire at all, he will be given another opportunity. If he fires one or more shots the score

must stand as his record. He will not be permitted to repeat his score on the claim that he was not ready to fire.

(4) As each shot is signaled from the pits it is announced by the scorer at the firing line. A score of 16 shots is announced as follows as each shot is marked: "Target 22; 1 five, 2 fives, 3 fives, 4 fives, 5 fives, 6 fives, 7 fives; 1 four, 2 fours, 3 fours, 4 fours, 5 fours, 6 fours; 1 two, 2 twos; 1 miss." The scorer notes these values on a pad and watches the target as he calls the shot. After marking is finished he counts the number of shots marked, and if it is more or less than 16 calls "Re-mark No. —." If 16 shots have been marked, he then enters the value of each hit and their total value on the soldier's score card.

b. In the pit.—(1) The time of fire allowed for each exercise is regulated by the officer in charge of the pit. As stated in the provisions of section VI he will cause the targets to be run up simultaneously 5 seconds after the receipt of the command *Ready on the firing line*. He will require them to remain fully exposed for the prescribed time and then to be simultaneously withdrawn. He will also cause the red flag to be waved and withdrawn upon receipt of the command *Ready on the firing line*.

(2) The officers scoring in the pits examine each of their targets in turn, announce the score, and record it on the pit score cards. Spotters are then placed in the shot holes and the targets run up and marked. The noncommissioned officers supervise the marking of each shot. The officers exercise general supervision over the marking of their targets.

(3) The targets are left up for about 1 minute after being marked. They are then withdrawn, pasted, and made ready for another score. They may be left up until ordered pasted by the officer in charge of the firing line.

(4) If more than 16 shots are found on any target in record practice, it will not be marked unless all of the hits are of the same value. The officer in charge of the firing line will be notified of the facts by telephone. In instruction practice the target will be marked.

58. Use of telephones.—*a.* Telephones will be used for official communication only.

b. No one will ask over the telephone for information as to the name or organization of any person firing on any particular target, and no information of this nature will be transmitted.

c. The following expressions will be used over the telephone in the cases enumerated:

(1) When a shot has been fired and the target has not been withdrawn from the firing position, "Mark No. —."

(2) When a shot has been fired and a target has been withdrawn from the firing position but not marked, "Disk No. —."

(3) When the target has been withdrawn from the firing position and marked but the value of the shot has not been understood, "Redisk No. —."

(4) When the firing line is ready for time fire, "Ready on the firing line."

(5) When a shot is marked on a target and the person assigned thereto has not fired, "Disregard the last shot on No. —."

59. Coaching prohibited.—Coaching of any nature after the firer takes his place on the firing line is prohibited. No person will render or attempt to render the firer any assistance whatever while he is taking his position or after he has taken his position at the firing point.

60. Use of instruments.—*a.* The use of field glasses is authorized and encouraged.

b. The use of instruments or devices for determining the force and direction of the wind is authorized and encouraged during instruction practice but is prohibited during record practice.

61. Shelter for firer.—Sheds or shelter for the individual at the firing point will not be permitted at any range.

62. Restrictions as to the rifle.—Troops will use the U. S. rifle, M1, as it is issued by the Ordnance Department. The use of additional appliances, such as temporary shades for the sights, spirit levels, and orthoptic eyepieces, is prohibited. The sights may be blackened. Ordnance Department test equipment will not be used for determining classification.

63. Trigger pull.—The trigger pull will be at least 3 pounds with the barrel vertical. It will be tested by an officer just before record practice, and during this practice if necessary.

64. Ammunition.—The ammunition used will be the service cartridge as issued by the Ordnance Department.

65. Cleaning.—Cleaning will be permitted only between scores.

66. Use of gun sling.—The gun sling will be used as prescribed for the various positions in these regulations, and in no other manner.

67. Pads and gloves.—*a.* Pads of moderate size and thickness may be worn on both elbows to protect them from bruising. A smooth pad of moderate size and thickness may be worn on either shoulder if desired. The use of other forms of pads is prohibited. The use of a hook, small roll, or ridge on the sleeve of the shooting coat or shirt to keep the sling in place on the arm is prohibited.

b. A glove may be worn on either hand provided it is not used to form an artificial support for the rifle.

68. Warming or fouling shots.—No warming or fouling shots will be allowed.

69. Shots cutting edge of bull's-eye or line.—Any shot cutting the edge of the figure or bull's-eye will be signaled and recorded as a hit in the figure or bull's-eye. Because the limiting line of each division of the target is the outer edge of the line separating it from the exterior division, a shot touching this line will be signaled and recorded as a hit in the higher division.

70. Slow fire score interrupted.—If a slow fire score is interrupted through no fault of the person firing, the unfired shots necessary to complete the score will be fired at the first opportunity thereafter.

71. Misses.—Before a miss is signaled in record firing the target will be withdrawn from the firing position and carefully examined by an officer. Whenever a target is run up and a miss is signaled it will be presumed that this examination has been thoroughly made. No challenge of the value signaled will be entertained or resignaling of the shot allowed.

72. Shots to be included in score.—All shots fired by the soldier in his proper turn after he has taken his place at the firing line and the target is ready will be considered as part of his score,

73. Firing on wrong target.—Shots fired on the wrong target will be entered as a miss on the score of the man firing, no matter what the value of the hit on the wrong target may be. In time fire the soldier at fault is credited with only such hits as he may have made on his own target.

74. Two shots on same target.—In slow fire, if two shots strike a target at the same time, or nearly the same time, neither will be marked. The individual who fired on his own target will be allowed another shot.

75. Withdrawing target prematurely.—In slow fire, if the target is withdrawn from the firing position just as a shot is fired, the scorer at that firing point will at once report the fact to the officer in charge of the scoring on that target. The officer will investigate to see if the case is as represented. Being satisfied that such is the case, he will direct the shot be not considered and that the man fire another shot.

76. Unfired cartridges in time fire.—Each unfired cartridge will be recorded as a miss.

77. More shots than prescribed in time fire.—When a target has more than the number of shots prescribed for the exercise in record practice the target will not be marked. The soldier firing on that target will repeat his score. If all the hits have the same value the target will be marked and he will be given the value of the authorized number of shots.

78. Record practice for course D, 1,000-inch range.—*a.* The following special provisions apply only to record practice for course D which is fired on the 1,000-inch range.

b. So much of the foregoing regulations for record practice as can be applied will be followed. Suitable fire orders for use on the type of 1,000-inch range which is equipped with pits and movable targets, as well as suitable fire orders for use on the type of 1,000-inch range which is not so equipped, will be found in section VI.

c. When the record practice is fired on 1,000-inch ranges not equipped with pits and movable targets the following rules will apply :

(1) Sufficient assistants will be detailed from companies other than the ones firing to assist the officer in charge. From the assistants, officers will be detailed as scorers at the rate of one for every 30 targets.

(2) The officers detailed as assistants will aid the officer in charge in every way possible. They will—

(a) Note deductions for penalties and report same to the scorer.

(b) Note the time out for stoppages and inspect to determine whether the stoppage was due to any fault of the soldier.

(c) Superintend the firing of rounds remaining from stoppages not the fault of the firer.

(d) Scorers will count the bullet holes in each target and report any that have more than the prescribed number.

(e) Scorers will score the targets in accordance with *g* below.

d. Each soldier will fire every exercise on the target. Targets will not be examined until all men of the order have completed firing.

e. Exercises will be fired in rotation as desired by the officer in charge. They should be fired with as little delay between exercises as possible.

f. (1) When a stoppage occurs that cannot be cleared by pulling back the operating handle and releasing it, the firer will call, "Time." The officer in charge of firing or an assistant will note the time left to complete the exercise. The stoppage will be reduced. The firer will load and complete the firing on command from the officer in charge who will allow the remaining time. In cases where the exact time remaining was not determined by the officer in charge, the firer will be allowed 3 seconds per round for the remaining rounds.

(2) If the stoppage is manifestly the fault of the firer, no time will be allowed to complete the exercise and only that part of the exercise which was fired will be scored.

(3) Should a breakage occur the gun will be repaired or a different rifle substituted. If a different rifle is substituted the firer will then be allowed four extra rounds to determine the zero of the substituted rifle. He will then complete the exercise.

g. The 1,000-inch record target will be scored in accordance with the requirements for record firing as follows:

(1) Hits within or cutting the line of the inner silhouette will count 5 points. Hits within or cutting the line of the middle silhouette will count 4 points. Hits within or cutting the line on the outside silhouette will count 3 points.

(2) Not to exceed four hits will be counted in scoring figures 1 and 2. Not to exceed two hits will be counted in each of the figures in scoring the traversing fire from figure 5 to figure 6, inclusive; and but one in scoring the traversing fire from figure 7 to figure 8, inclusive.

(3) Hits cutting the line of two scoring figures will be counted so as to give the soldier the highest score.

(4) For firing before *Commence firing* or after *Cease firing*, 5 points will be deducted for each round so fired.

(5) In case of hits on the wrong target, the firer who received the erroneous hits will refire his score. The firer who placed his hits on the wrong target will count only those upon his own and will not be permitted to refire the exercise.

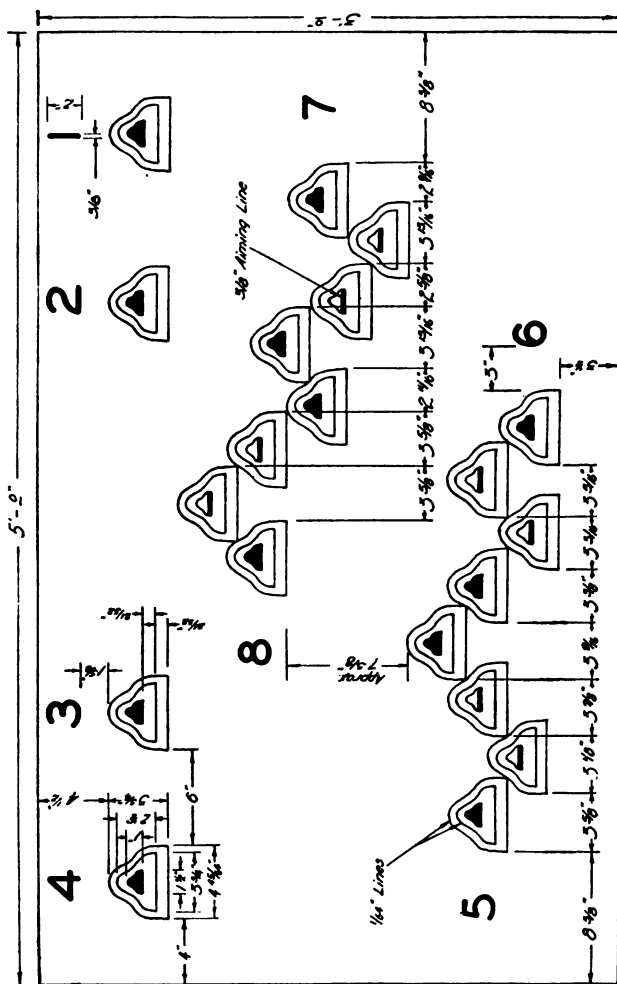
SECTION VIII

TARGETS AND RANGES

79. Targets.—The designations and dimensions of the two types of target used for marksmanship courses for the U. S. rifle, M1, are as follows:

a. The 1,000-inch target, U. S. rifle, M1 (see fig. 10).—(1) This target is used for all fire on the 1,000-inch range. It is designed to give instruction in fixed, traversing, and searching fire. The scoring figures are numbered from 1 to 8, inclusive. Each of these scoring figures is composed of three silhouettes. These silhouettes are reduced in scale from target D which is used on the known-distance range. The inner silhouettes of the 1,000-inch target represent the silhouette of target D at 500 yards. The middle silhouette of the 1,000-inch target represents the four space of target D at 300 yards. The outer silhouettes of the 1,000-inch target represent the four space of target D at 200 yards. As the factors of wind and light are negligible in 1,000-inch firing, the three space and the two space of target D are not represented on the 1,000-inch target. Hits in the inner silhouettes of the 1,000-inch targets count 5; in the middle silhouettes 4; and in the outer silhouettes 3.

(2) The prescribed 1,000-inch target will not be altered in any manner. If issue 1,000-inch targets are not available, satisfactory 1,000-inch targets can be readily improvised. Such



improvised targets will conform in all respects to the prescribed target shown in figure 10. Targets can be readily drawn on any suitable paper by the use of stencils or templates cut from any available material to the dimensions of the three silhouettes. Black crayons of the commercial type used in bowling alleys are suitable for drawing purposes.

b. Target D.—This target is used for all slow and time fire on the known-distance range. It consists essentially of a square target, 6 by 6 feet in dimensions, upon which a black silhouette, representing a prone figure, is centered. Hits in the silhouette count 5, in the next space 4, and in the next 3. Hits on the remainder of the target count 2.

80. Ranges.—*a.* Ranges suitable for range firing with the U. S. rifle, caliber .30, M1903, are equally suitable for range firing with the U. S. rifle, M1.

b. The installation and construction of target ranges for small-arms target practice is governed by AR 30-1505. The installation of range communication systems is governed by AR 105-20. Range regulations for firing ammunition in time of peace are given in TR 140-5 and include the safety limits and danger areas of ranges. Information in regard to the selection of ranges is contained in chapter 1, part one, BFM, volume III.

SECTION IX

ADVICE TO INSTRUCTORS

81. Provisions not mandatory.—The provisions of this section are given as a guide and will not be considered as having the force of regulations.

82. Units detailed to range.—*a.* The size of the units detailed upon the range is covered in training programs and schedules and depends largely upon local conditions, such as the size of the range, the number of men to be instructed, and the duty being performed by the troops.

b. Where range facilities permit, it is desirable to conduct preparatory marksmanship training and range practice by battalions. The entire battalion undergoing such instruction should be relieved from as many other duties in camp or garrison as is practicable.

83. Place of assembly for instruction.—The mess halls or other buildings of camp and garrison are suitable places for the instruction in mechanical training and related subjects. Preparatory marksmanship training should be conducted outdoors in the best and most comfortable locations available.

84. Training of instructors.—*a.* It is essential to have the company officers and noncommissioned officers who act as the instructors of their units trained in advance of their units in all phases of marksmanship instruction.

b. For this purpose officers and noncommissioned officers of other units may be attached to a particular unit at any phase of its instruction. These act as instructors when their own units take up the work. A few days' experience gained by instructors in preparatory marksmanship training and in range practice will prove especially useful.

85. Inspection of equipment.—The instructor should personally inspect the equipment for the preparatory exercises before the training begins. All equipment used in the preparatory exercises should be accurately and carefully made. A set of model equipment should be prepared in advance by the instructor for the information and guidance of the organizations about to take up the preparatory work.

86. Inspection of rifles.—All rifles should be carefully inspected far enough in advance of the period of training to permit organization commanders to replace all inaccurate or defective rifles. Rifles having badly pitted barrels are not accurate and should not be used.

87. Ammunition.—The officer in charge of firing should take pains to see that the best ammunition available is reserved for record firing and that the men have a chance to learn their sight settings with that ammunition before record practice begins. *Ammunition of different makes and of different lots should not be used indiscriminately.*

88. Organization of the work.—*a. In preparatory marksmanship training.*—(1) The ground upon which preparatory marksmanship training is to be given should be selected in advance and a section of it assigned to each organization. The equipment and apparatus for the work should be on the ground and in place before the work starts.

(2) The group under instruction may be organized in two lines, 10 to 15 yards apart, and facing *away* from each other. The company officers and other instructors, whose position is normally between the lines, then have all of their squads under close supervision.

(3) The arrangement of the equipment for the preparatory exercises may be as follows:

(a) The sighting bars and rifle rests are placed on each line at sufficient intervals to permit efficient work.

(b) Fifty feet from each line is placed a line of small boxes with blank paper tacked on one side, one box and one small sighting disk to each rifle rest.

(c) At the side of each box a tall stake about 8 inches wide is driven into the ground. On each stake are three aiming targets placed at the proper height for aiming from the prone, sitting, and standing positions.

(d) Two hundred yards from each line is placed a line of frames suitable for 200-yard aiming group exercises, one frame to each squad. These frames have blank paper pasted or tacked on the front. A 10-inch sighting disk is placed with each frame. Machine-gun targets make suitable frames for this work.

(4) For time-fire exercises the company may be organized in one line with the D targets placed 200 yards away.

b. In range practice.—(1) The range work should be so organized that there is a minimum of lost time on the part of each man. Long periods of inactivity while waiting for a turn on the firing line should be avoided and waiting periods should be utilized in some form of instruction.

(2) As a general rule six men per target is about the maximum and four men per target the minimum for efficient handling.

(3) The following method of carrying on range practice has been found to produce excellent results:

(a) Firing is begun by a group consisting of approximately half of the organization. This group is made up of those most proficient in preparatory work and those known to be good shots. The remaining men of the company perform all fatigue until the first group has completed firing.

(b) When the first group has completed firing, the second group, made up of those who have not fired, begins firing. The men of the first group perform all fatigue.

89. Model schedules.—The following tables may be found useful in preparing a schedule of marksmanship training. This table is not mandatory and at best can only be used as a guide. Various units will be in different stages of training, range equipment and instructors will vary, while weather may interfere with the full amount of outdoor instruction. The following schedule is based on the assumption that only the instructors of the organization being trained are familiar with the U. S. rifle, M1. The schedule is based on 3 weeks of 5½ training days each. The normal training day is considered to be 7 hours.

a. Mechanical training.

Subject	Where taught	How taught	Time allotted	Days
Description of the rifle.	Lecture room, assembly hall, parade ground.	Lecture.....	15 mins.....	1st day (Monday).
Disassembling and assembling.	do.....	Demonstration and practical work.	6 hrs. 45 mins..	1st day.
Care and cleaning of the rifle.	do.....	do.....	2 hrs. 30 mins..	2d day.
Functioning.....	do.....	do.....	3 hrs.....	Do.
Service of the rifle.	do.....	do.....	1 hr. 30 mins..	Do.
Immediate action and stoppages.	do.....	do.....	do.....	3d day.
Examination.....	do.....	do.....	4 hrs.....	Do.

b. Preparatory training.

Subject	Where taught	How taught	Time allotted	Days
Purpose of preparatory marksmanship training.	Parade ground.	Lecture.....	15 mins.....	4th day.
1st sighting and aiming exercise.	do.....	Demonstration and practical work.	1 hr. 45 mins..	Do.
Blackening the sights.	do.....	do.....	15 mins.....	Do.
2d sighting and aiming exercise.	do.....	do.....	3 hrs. 45 mins..	Do.
3d sighting and aiming exercise.	do.....	do.....	1 hr.....	Do.
Position and sling.	do.....	Lecture.....	4 hrs.....	5th day.
Taking up slack and holding the breath.	do.....	do.....	30 mins.....	Do.
Prone position.....	do.....	Practical work.	2 hrs. 30 mins..	Do.
Sitting position.....	do.....	do.....	1 hr. 30 mins..	6th day.

Subject	Where taught	How taught	Time allotted	Days
Kneeling position....	Parade ground.	Practical work.	1 hr. 30 mins..	6th day.
Standing position....	do.....	do.....	1 hr.....	Do.
Assuming positions rapidly.	do.....	do.....	2 hrs.....	7th day (Monday).
Short skirmish run....	do.....	do.....	do.....	7th day.
Trigger squeeze and calling shot.	do.....	Lecture.	15 mins.....	Do.
Trigger-squeeze exercises.	do.....	Practical work.	2 hrs. 45 mins..	Do.
Time fire.....	do.....	Lecture.	15 mins.....	8th day.
Time-fire exercises....	do.....	Practical work.	6 hrs. 45 mins..	Do.
Review of all subjects.	do.....	do.....	4 hrs.....	9th day.
Examination ¹	do.....	do.....	7 hrs.....	10th day.

¹ Lack of proficiency disclosed by examination will be corrected at once by additional instruction.

NOTE.—The use of the score book and effects of light and wind will be taken up with men who are not actually on the line undergoing instruction.

c. Range practice, course A.

Subject	Where taught	How taught	Time allotted	Days
To zero the rifle, 1,000-inch range and fire table II.	1,000 - inch range.	Demonstration and practical work.	11 hrs.....	11th and 12th days.
To fire table III.....	do.....	do.....	do.....	13th day (Monday). 4 hrs. of 14th day.
To fire instruction practice.	Known - distance range.	do.....	21 hrs.....	3 hrs. of 14th day, 15th day, 16th day, 17th day.
To fire record practice.	do.....	Practical work	7 hrs.....	18th day.

NOTE.—The time allotted for firing the known-distance range is based on 6 orders per target, and a dry run preceding each practice for each man.

SECTION X

SMALL-BORE PRACTICE

90. Object.—The object of small-bore practice is to provide a form of marksmanship training with the caliber .22 rifle and ammunition which represents the application of the principles taught in the preparatory exercises. Small-bore practice provides an excellent means of improving the shooting of organiza-

tions and sustaining interest in marksmanship throughout the year.

91. Value.—The chief value of small-bore practice lies in the fact that it is convenient, interest sustaining, and economical. It does not have the full value of caliber .30 practice but on account of its convenience and saving in the cost of ammunition, organization commanders will find that small-bore practice is a valuable step in marksmanship training.

92. Continuous small-bore practice.—Small-bore practice should be carried on throughout the year, subject to such limitation as may be imposed by allowances of ammunition. Individuals will be given a thorough course of preparatory instruction before being permitted to fire on the small-bore range. All small-bore practice will be properly organized and supervised in accordance with the methods of instruction prescribed in this manual.

93. Firing.—Small-bore practice will be fired with U. S. rifle, caliber .22, M1922, M1 or M2.

94. Courses to be fired.—*a.* One of the following small-bore courses should be fired by each rifleman. The particular course to be fired may be designated by higher authority, or its selection may depend upon training time, ammunition allowances, or range facilities. Wherever applicable, the provisions of sections VI and VII will be rigidly enforced.

COURSE A
1,000-INCH RANGE
TO ZERO THE RIFLE

TABLE I

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	No limit.	5	No. 1, 1,000-inch target for U. S. rifle, M1.	Prone or prone with sandbag.	Loop sling.
1,000	---do----	5	No. 2, 1,000-inch target for U. S. rifle, M1.	Sitting-----	Do.
1,000	---do----	5	No. 3, 1,000-inch target for U. S. rifle, M1.	Kneeling-----	Do.
1,000	---do----	5	No. 4, 1,000-inch target for U. S. rifle, M1.	Standing-----	Do.

INSTRUCTION PRACTICE

TABLE II.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	No limit.	8	No. 5 to No. 6, 1,000-inch target for U. S. rifle, M1.	Prone-----	Loop sling. Traverse and search. 1 shot at each figure. Do.
1,000	---do---	8	No. 7 to No. 8, 1,000-inch target for U. S. rifle, M1.	Kneeling-----	

TABLE III.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Inches</i> 1,000	<i>Seconds</i> 40-----	5	No. 1, 1,000-inch target for U. S. rifle, M1.	Standing to prone.	Loop sling.
1,000	40-----	5	No. 2, 1,000-inch target for U. S. rifle, M1.	Standing to sitting.	Do.
1,000	40-----	5	No. 3, 1,000-inch target for U. S. rifle, M1.	Standing to kneeling.	Do.
1,000	60-----	5	No. 4, 1,000-inch target for U. S. rifle, M1.	Standing-----	Hasty sling.
1,000	75-----	8	No. 5 to No. 6, 1,000-inch target for U. S. rifle, M1.	Prone to prone, rush 25 yards.	Loop sling. 1 shot at each figure.
1,000	75-----	8	No. 7 to No. 8, 1,000-inch target for U. S. rifle, M1.	Prone to kneeling, rush 25 yards.	Do.

NOTE.—Tables I and II should be completed on one target by each man during one period on the firing line. When all orders have completed tables I and II, the work should proceed to table III. Table III should likewise be completed by each firer on one target. Bolt-action rifles should be loaded and locked before the rush to the firing line. For the last two exercises extra magazines containing three rounds should be carried. Firing may be conducted on a 50-foot (600-inch) range by utilizing the target—U. S. rifle, caliber .30 M1—50-foot firing.

INTERMEDIATE RANGE PRACTICE

INSTRUCTION PRACTICE

TABLE IV.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 50	No limit.	10	SB-50 yards D target.	Prone.....	Loop sling.
50	do.....	10	do.....	{5 kneeling..... 5 sitting.....	Do.
50	do.....	10	do.....	Prone to kneeling, rush 25 yards.	Do.

TABLE V.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 50	<i>Seconds</i> 75.....	10	SB-50 yards D target.	Standing to prone.	Loop sling.
50	75.....	10	do.....	Prone to kneeling, rush 25 yards.	Do.
50	75.....	10	do.....	Prone to prone, rush 25 yards.	Do.

NOTE.—The firing included in tables IV and V is optional. If no 50-yard range is available tables IV and V will be fired at 100 yards on the SB-100 yards D target. This note applies only to course A.

LONG RANGE PRACTICE

TABLE VI.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 100	No limit.	10	SB-100 yards D target.	Prone.....	Loop sling.
100	do.....	10	do.....	{5 sitting..... 5 kneeling.....	Do.
100	do.....	10	do.....	Standing to prone. All shots fired in prone position.	Do.
200	do.....	10	SB-200 yards D target.	Prone.....	Do.
200	do.....	10	do.....	Standing to prone. All shots fired in prone position.	Do.

TABLE VII.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 100	<i>Seconds</i> 80-----	10	SB-100 yards D target.	Standing to prone.	Loop sling.
100	100-----	10	-----do-----	Prone to prone, rush 25 yards.	Do.

RECORD PRACTICE

TABLE VIII.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 100	No limit.	10	SB-100 yards D target.	Kneeling-----	Loop sling.
200	---do---	10	SB-200 yards D target.	Prone-----	Do.

TABLE IX.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 100	<i>Seconds</i> 80-----	10	SB-100 yards D target.	Standing to prone..	Loop sling.
100	100-----	10	-----do-----	Prone to prone, rush 25 yards.	Do.

COURSE B

Fire tables I, II, III, IV, and V of course A

LONG RANGE PRACTICE

INSTRUCTION PRACTICE

TABLE X.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 100	No limit.	10	SB-100 yards D target.	Prone-----	Loop sling.
100	---do---	10	-----do-----	Standing to prone. All shots fired in prone position.	Do.

TABLE XI.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 100	<i>Seconds</i> 80-----	10	SB-100 yards D target.	Standing to prone.	Loop sling.
100	100-----	10	-----do-----	Prone to prone, rush 25 yards.	Do.

RECORD PRACTICE

TABLE XII.—*Slow fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 50	Nolimit.	10	SB-50 yards D target.	Kneeling-----	Loop sling.
100	---do----	10	SB-100 yards D target.	Prone-----	Do.

TABLE XIII.—*Time fire*

Range	Time	Shots	Target	Position	Remarks
<i>Yards</i> 50	<i>Seconds</i> 75-----	10	SB-50 yards D target.	Prone to prone, rush 25 yards.	Loop sling.
100	100-----	10	SB-100 yards D target.	-----do-----	Do.

COURSE C

Fire tables I and II. Fire table III three times

RECORD PRACTICE

Fire table III once eliminating the firing of 5 shots standing to sitting and firing 10 in place of 5 shots from standing to kneeling.

b. Ammunition requirements and qualification scores:

Course	Ammunition	Possible score	Expert	Sharp-shooter	Marksman
A-----	242	200	180	160	130
B-----	212	200	180	160	130
C-----	180	180	165	140	115

W3.63: 3 pt. 1 / chap. 2

R

WAR DEPARTMENT

BASIC FIELD MANUAL



Volume III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 2

AUTOMATIC RIFLE MARKSMANSHIP

BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 2 AUTOMATIC RIFLE MARKSMANSHIP

**PREPARED UNDER DIRECTION OF THE
CHIEF OF INFANTRY**



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932**

**For sale by the Superintendent of Documents, Washington, D. C.
Price 15 cents**

WAR DEPARTMENT,
WASHINGTON, *March 25, 1932.*

Chapter 2 (Automatic Rifle Marksmanship), Part One (Rifle Company), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (4-13-31).]

BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,
General,
Chief of Staff.

OFFICIAL:

C. H. BRIDGES,
Major General,
The Adjutant General.

II

FOREWORD

Basic Field Manual, Volume III, Basic Weapons, will be published in six parts as follows:

PART ONE. Rifle company. (Each chapter of Part One will be published as a separate pamphlet.)

Chapter 1. Rifle marksmanship.

2. Automatic rifle marksmanship.
3. Automatic pistol marksmanship.
4. Instruction with the bayonet.
5. Instruction with hand and rifle grenades.
6. Musketry.

PART TWO. Fire-control instruments.

Chapter 1. Machine-gun instruments.

2. 37-mm. gun and 3-inch trench mortar instruments.
3. Care, repair, and adjustment of instruments.

PART THREE. Machine-gun company.

Chapter 1. Mechanical training with the machine gun.

2. Machine-gun marksmanship.
3. Technique of machine-gun fire.
4. Barrages and concentrations.

PART FOUR. Howitzer company.

Chapter 1. Mechanical training with the 37-mm. gun and the 3-inch trench mortar.

2. 37-mm. gun and the 3-inch trench mortar marksmanship.
3. Technique of the 37-mm. gun and the 3-inch trench mortar fire.

PART FIVE. Combat practice firing.

Chapter 1. General.

2. Rifle company.
3. Machine-gun company.
4. Howitzer company.

PART SIX. Antiaircraft marksmanship—Infantry weapons.

Chapter 1. General.

2. Rifle and automatic rifle.
3. Machine gun, caliber .30.

TABLE OF CONTENTS

	Paragraphs	Page
SECTION I. Introduction-----	1-2	1
II. Mechanical training with the automatic rifle	3-9	1-3
III. Description and general data of the automatic rifle-----	10-11	3, 4
IV. Field disassembling and assembling and functioning of the automatic rifle-----	12-15	5-11
V. Stoppages and immediate action-----	16-21	11-17
VI. Miscellaneous instruction with the automatic rifle-----	22-27	17-20
VII. Care and cleaning of the automatic rifle----	28-35	21-23
VIII. Adjustments of the automatic rifle-----	36	23, 24
IX. Examination on mechanical training with the automatic rifle-----	37	24-27
X. Preparatory range training-----	38-49	28-37
XI. Range practice-----	50-81	38-48
XII. Advice to instructors-----	82-85	49-56

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 2

AUTOMATIC RIFLE MARKSMANSHIP

(The matter contained herein supersedes TR 150-30, November 21, 1923 (including C1, February 15, 1926; C2, January 3, 1927; C3, January 3, 1928; and C4, January 2, 1929).)

SECTION I

INTRODUCTION

1. **Scope.**—This chapter prescribes rules and regulations applicable to the general subject of automatic rifle marksmanship.

2. **Outline of training.**—*a.* Training with the automatic rifle is divided into the following phases:

- (1) Mechanical training.
- (2) Preparatory range training.
- (3) 1,000-inch range practice.
- (4) Known-distance range practice.

b. A thorough course in rifle marksmanship (ch. 1) should precede training with the automatic rifle.

SECTION II

MECHANICAL TRAINING WITH THE AUTOMATIC RIFLE

3. **Object.**—Mechanical training is designed to give the soldier such training as will insure his ability to maintain the continued successful mechanical operation of the automatic rifle. A rifle is of no use tactically unless it functions successfully mechanically.

4. **When taken up.**—Mechanical training precedes 1,000-inch and known-distance range practice. It may be carried on concurrently with the preparatory range training.

5. **To whom applicable.**—At least four soldiers per rifle squad will be given instruction in the mechanical operation of the automatic rifle as outlined herein.

6. **Organization.**—In the company or platoon, all enlisted men are combined into one class under a commissioned instructor. Each sergeant supervises his own section as assistant instructor, and each corporal acts as instructor for his squad.

7. **Methods of instruction.**—*a.* To secure uniformity, instruction is given to the entire class at one time.

b. The instructor prefaces his explanation with a brief general talk leading up to the specific subject under discussion. He then makes detailed explanations and demonstrations as he proceeds.

c. The instructor again explains the work, while one man in each squad performs it and the other members observe him.

d. Each member of the squad then repeats the work, checked by the others. This is continued until all men are proficient in performing the particular operation.

e. As squad leaders deem certain men proficient, they examine them and report their qualifications to their platoon leaders.

8. **Equipment.**—*a.* The equipment required for each lesson is listed in Section XII.

b. A classroom equipped with a blackboard and platform for the instructor is desirable. Seats are provided for the entire class, and one table per squad sufficiently large to permit the entire squad to be grouped around it while working on the automatic rifle.

9. **Classroom regulations.**—The following regulations will be observed in the classroom:

a. Force.—Force will not be used in disassembling or assembling. The rifle is so constructed that it can be taken apart and reassembled without the use of force. Most of the parts are designed to prevent wrong assembling. When difficulty arises in disassembling and assembling, it is due to error on the part of the soldier. The use of force will result only in damage to the rifle.

b. Time.—The piece is not disassembled or assembled against time. The practice of disassembling and assembling against

time serves no useful purpose and results in burring and damaging parts. As men become more familiar with the rifle, skill is gradually developed and lost motion eliminated. In disassembling, the men are taught to lay the parts out in the proper sequence for assembling, and should so thoroughly learn the mechanism of the rifle that taking it apart and putting it together are matters of second nature.

c. Trigger mechanism.—The trigger mechanism is not disassembled and assembled blindfolded. The purpose of disassembling and assembling blindfolded is to train men to be able to do these operations at night. As the trigger mechanism is not a part of field disassembling it will rarely ever be disassembled at night even in action. Breakages in the trigger mechanism are very rare.

SECTION III

DESCRIPTION AND GENERAL DATA OF THE AUTOMATIC RIFLE

10. Description.—The Browning automatic rifle, caliber .30, M1918, is an air-cooled gas-operated, magazine-fed, shoulder weapon. It has no special cooling system, the barrel being exposed to the air, and the hand of the firer being protected on the underside of the barrel by a large wooden forearm. Care must be taken to avoid touching the barrel during firing. The rifle is operated by the power furnished by expanding powder gases following ignition of the cartridge. These powder gases expand through a port in the barrel and act upon the head of a piston, driving it to the rear. During rearward movement, the processes of unlocking, extraction, ejection, and compression of the recoil spring are effected; during the forward movement, feeding, locking, and igniting the cartridges are accomplished. The rifle is fed from a magazine having a capacity of 20 cartridges. This rifle can be fired effectively from all positions prescribed in chapter 1. It is capable of being fired at the rate of 150 rounds per minute, semiautomatic. The rate of fire, however, which gives the best results in the normal case is 40 to 60 shots per minute, semiautomatic.

11. General data.

Weight of rifle, 15 pounds 8 ounces.

Weight of magazine, empty, 7 ounces.

Weight of magazine, filled, 1 pound 7 ounces.

Length of barrel, 24 inches.

Over-all length, 47 inches.

Sights graduated to 1,600 yards.

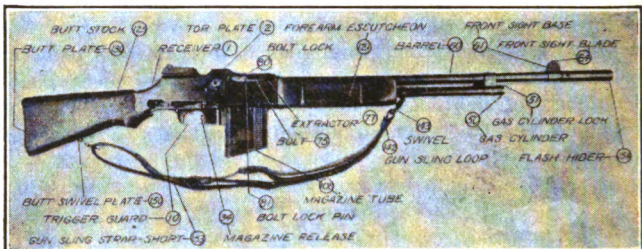


FIGURE 1.—Rifle, automatic, cal. .30, Browning, M1918 (right side view)

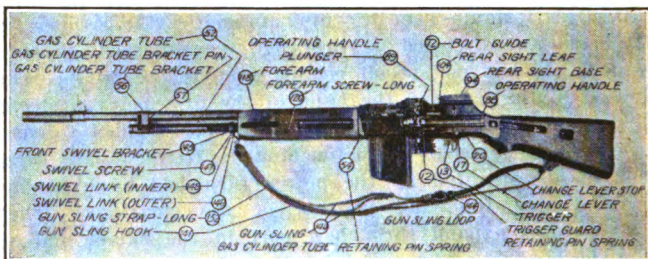


FIGURE 2.—Rifle, automatic, cal. .30, Browning, M1918 (left side view)

Caliber bore, 0.30 inch.

Gas port from muzzle, 6 inches.

Rate of uninterrupted automatic fire (cyclic rate), 600 shots per minute.

Chamber pressure, 47,000 to 50,000 pounds per square inch.

Muzzle velocity, about 2,680 feet per second.

Habitual type of fire, semiautomatic.

Head space limits, 1.940 to 1.950 inches.

Length of recoil spring, 15.5 inches.

SECTION IV

FIELD DISASSEMBLING AND ASSEMBLING AND
FUNCTIONING OF THE AUTOMATIC RIFLE

12. Disassembling.—*a. Sequence and method.*—Steps in disassembling will be taken in the following sequence:

- (1) Cock the piece.
- (2) Remove gas cylinder tube retaining pin.
- (3) Remove gas cylinder tube and forearm (letting mechanism forward easily).
- (4) Remove the trigger guard retaining pin.
- (5) Remove trigger guard.
- (6) Remove recoil spring guide and recoil spring.
- (7) Push hammer pin through hammer-pin hole in receiver.
- (8) Remove operating handle.
- (9) Remove hammer pin.
- (10) Remove hammer.
- (11) Remove slide.
- (12) Push out bolt guide.
- (13) Remove bolt, bolt lock, and bolt link.
- (14) Remove bolt-link pin and bolt link.
- (15) Remove firing pin.
- (16) Remove extractor and spring.

b. Detailed explanation.—Lay the rifle on the table, barrel down, pointing to the left. Cock the piece. This must be done in order that the gas cylinder tube may clear the gas piston and gas cylinder bracket, female. Turn the gas cylinder tube retaining pin spring (54) 90° in a clockwise direction and lift out gas cylinder tube retaining pin (53). Remove gas cylinder tube and forearm (118). Release the slide (45), retarding its forward motion, so as to slowly release the tension of the recoil spring, and thereby avoid damage to the face of the bolt. Care must be taken during disassembling and assembling to avoid working against tension of any springs. Turn the trigger guard retaining pin spring (12) 90° in a clockwise direction and remove it to the right. Lift out the trigger guard group. Remove the recoil spring guide (41) by pressing the right index finger on the checkered surface of its head and turning it until the ends are clear of the retaining shoulders. This may also be done by using the index finger of the left hand and the middle finger of the right hand. Line up the hammer-pin holes on the receiver and

the operating handle by inserting the point of the recoil spring guide or dummy cartridge in the hole on the operating handle with the right hand, press against the hammer pin (86) and push the slide backward with the left hand. The recoil spring guide will push the hammer pin through its hole in the receiver as the hammer pin registers with the latter. Remove the operating handle (88) by pulling straight to the rear. Push the hammer (85) forward out of its seat in the slide (45) and lift out of the receiver. Remove the slide (45) by pulling forward out of the receiver, being careful that the bolt link (82) is pushed well down, thus allowing the slide to clear. In removing the slide take care to avoid striking the gas piston or rings against the gas cylinder tube bracket, female (56). Force the bolt guide (72) out with the left thumb or point of bullet. Lift out the bolt, bolt lock, and bolt link by pulling slowly to rear end of receiver and up. Pull out the firing pin (76) from its way in the bolt (75). Using firing pin as drift, push out bolt link pin (83) and remove bolt link. Remove the extractor (77) by pressing the small end of a dummy cartridge against the claw and exerting pressure upward and to the front. (Figs. 2 and 3.)

13. Assembling.—*a. Sequence and method.*

- (1) Extractor and spring.
- (2) Firing pin.
- (3) Bolt link and bolt link pin.
- (4) Bolt, bolt lock, and bolt link.
- (5) Slide.
- (6) Hammer.
- (7) Hammer pin (far enough to register all holes).
- (8) Operating handle.
- (9) Hammer pin fully seated.
- (10) Recoil spring and guide.
- (11) Trigger guard.
- (12) Trigger guard retaining pin.
- (13) Cock the piece.
- (14) Gas cylinder tube.
- (15) Gas cylinder tube retaining pin.
- (16) Let slide forward easily.

b. Detailed explanation.—Replace extractor spring (78). Replace extractor (77) into its seat in the bolt. Place the bolt link (82) and bolt link pin (83) with the shoulder of the link against the flat surface of the bolt lock (80). Lift the bolt lock and replace the firing pin (76). Lay the piece barrel

down and pointing to the left so that the piece is resting on the barrel and rear sight. With the bolt mechanism held in a perpendicular position, insert it in the receiver, forcing the end of the bolt under the ends of the bolt supports, and then press the bolt mechanism down so as to lie flat in its place. Push the bolt mechanism forward, swing the bolt link down, then replace the slide (45) and push it all the way back. With the hammer (85) resting between the thumb and the forefinger, lower and seat it properly in the receiver and push the slide forward. With the thumb and forefinger of the right

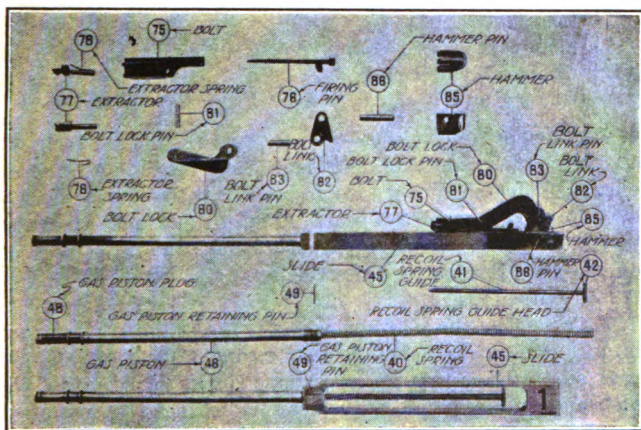


FIGURE 3.—Operating group

hand, align the hammer pin holes of the bolt link, hammer, and slide with the hammer pin hole in the side of the receiver. Insert hammer pin (86) to the right until only one-fourth inch of the hammer pin protrudes from the receiver. Replace the operating handle (88). Tap the end of the protruding hammer pin with sufficient force to drive it home. Replace recoil spring (40) and guide (41). With the end of the index finger on the checkered end of the recoil spring guide head, turn it until it is properly seated. Replace the trigger guard and trigger guard retaining pin (11). Cock the piece. Slide the gas cylinder tube and forearm (118) to the rear of the gas piston. Replace gas cylinder tube retaining pin (53). Test the piece. (Fig. 3.)

14. Disassembling and assembling trigger mechanism.—**a. Sequence of disassembling.**

- (1) Ejector.
- (2) Magazine catch spring.
- (3) Magazine catch pin.
- (4) Magazine catch.
- (5) Magazine release.
- (6) Sear spring.
- (7) Trigger pin.
- (8) Trigger and connector.
- (9) Sear pin.
- (10) Sear.
- (11) Sear carrier and counterrecoil spring.
- (12) Change lever spring.
- (13) Change lever.

b. Detailed disassembling.—(1) Depress the ejector lock (30) with the point of a dummy cartridge. Hold the thumb in front of the magazine catch spring (33) to prevent it flying out and slide the ejector (29) out of its seat. (Fig. 4.) Remove the magazine catch spring. Remove the magazine catch pin (35) and then the magazine catch (32) and magazine release (34) may be lifted out. (Fig. 4.)

(2) To remove the sear spring (26), insert the trigger guard retaining pin spring under the sear spring (26) above the connector stop (27). Pry up, pressing against sear spring with thumb and pulling it out to the rear. Push out the trigger pin (14) and then the trigger (13) and connector (16) can be removed through top of trigger guard. (Fig. 4.) Push out sear pin (24), with recoil spring guide (41). (Fig. 3.) Remove sear (23). Pry up on sear carrier (25) and lift out. Remove the change lever spring (18) by prying the bent end out of its seat with the rounded end of the sear spring and moving the change lever from front to rear. When clear of the change lever, push it out the rest of the way by pressing with the thumb against the sear stop. (Fig. 4.)

(3) Pull out the change lever.

c. Detailed assembling.—Assembling is in reverse order of the disassembling; the following points should be observed:

(1) It is easy to seat the magazine catch spring (33) if the ejector (29) is moved down until it is flush with the magazine catch spring before attempting to compress the latter. (Fig. 4.)

(2) In assembling the change lever spring (18), first insert the ears in the slots in the trigger guard and push spring forward a slight distance, then insert the rounded end of the sear spring (26) between the rear end of the trigger guard and the change lever spring. By prying up with the sear spring and

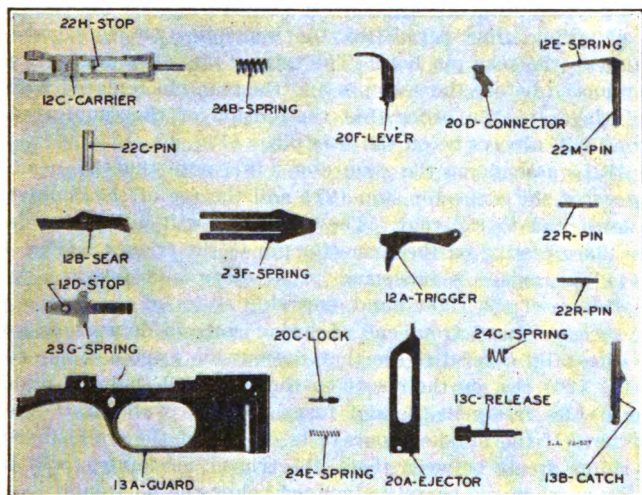


FIGURE 4.—Trigger guard group

Carrier, sear (12C)	Release, magazine (13C)
Catch, magazine (13B)	Sear (12B)
Connector (20D)	Stop, connector (22H)
Ejector (20A)	Stop, sear (12D)
Guard, trigger (13A)	Spring, change lever (23G)
Lever, change (20F)	Spring, counterrecoil (24B)
Lock, ejector (20C)	Spring, ejector lock (24E)
Pin, magazine catch (22R)	Spring, magazine catch (24C)
Pin, sear (22C)	Spring, sear (23F)
Pin, trigger (22R)	Spring, trigger guard retaining pin (12E)
Pin, trigger guard retaining (22M)	Trigger (12A)

at the same time pressing forward against the sear stop (19) and rotating the change lever (17) from rear to front the change lever spring is easily seated. Assemble sear carrier (25) and counterrecoil spring (28) to trigger mechanism by inserting the counterrecoil spring guide (front of sear carrier)

in the seat. Then, using the recoil spring guide as a lever in the sear-pin hole, pry the sear carrier forward until its rear end is held by the ears of the change lever spring. Insert the sear (23) and force the recoil spring guide through so as to register the holes in the sear, sear carrier (25), and trigger guard for the sear pin. By a slight pressure on the recoil spring guide push the sear carrier forward against the counter-recoil spring, thus permitting the sear pin (24) to be easily seated in the sear pin hole. The trigger pin (14) must always be removed before the sear pin and the sear pin replaced before the trigger pin, in order that the tension of the counterrecoil spring will always be on the sear pin. (Fig. 4.)

(3) In assembling the connector (16), note that its head is in rear of the connector stop (27) and the toe of the connector is down and to the rear. The connector will ordinarily drop into place resting on the connector pin in the trigger. (Fig. 4.)

(4) To replace sear spring, press down and forward with the thumb of the right hand, engaging slides of the spring, in the recesses, until front end of spring rests in depression stop. Be especially careful to see that the outside prongs of the sear spring (26) rest on their seat on the sear, and that the middle prong rides freely in the slot formed by the walls of the sear carrier. If the middle prong rests on one of the walls instead of riding freely between them, the trigger mechanism will not function when the barrel is inclined below the horizontal.

(5) After the trigger mechanism has been assembled, turn the change lever to the forward position and pull the trigger. If the connector will not rise, it is not in place correctly. It should rise and snap out from under the sear. If the connector will rise but does not raise the sear, the sear spring is weak and should be replaced.

15. Functioning (for description of functioning in detail see TR 320-25).—A cartridge having been ignited, the bullet under the action of the expanding powder gases travels through the barrel, and when it reaches a point near the end of the muzzle passes over a port in the bottom of the barrel. The gas expands through this port into a well in the gas cylinder and acts upon the head of the gas piston, driving it to the rear. As the piston is forced back it carries with it the slide, to which it is attached, causing the compression of the recoil spring. The slide, as it first moves rearward, imparts no

motion to the bolt lock, thereby allowing the high pressure in the bore to be decreased before unlocking begins. The slide continues its movement to the rear causing the link to pull the bolt lock down and away from the locking recess in top of receiver. As the bolt lock is pulled down a cam surface on its underside comes in contact with a lug on the firing pin, camming the firing pin away from face of bolt and keeping it securely locked away from the face of the bolt, at all times, when the mechanism is not locked in its forward position. After the bolt lock has been pulled down from out of the locking recess, the bolt is pulled to the rear, carrying with it the empty cartridge case which is being slowly extracted from the chamber and which is held on the face of bolt by the extractor. Shortly before the mechanism reaches its rearward position the base of the cartridge strikes the ejector, causing the empty cartridge case to be pivoted about the ejector and through the ejection opening. The rearward movement is terminated when the slide strikes the buffer. If the sear nose is depressed the mechanism will go forward under the action of the compressed recoil spring, feeding a cartridge into the chamber, locking the mechanism, releasing the firing pin, and firing the next round. If the sear nose is not depressed the sear notch on the slide will engage with the sear nose and the trigger must then be pulled before the mechanism will move forward.

SECTION V

STOPPAGES AND IMMEDIATE ACTION

16. Classes.—Stoppages are divided into two general classes, prolonged and temporary. This section deals entirely with temporary stoppages.

a. Prolonged, which are due to failure of some part which can not be replaced or to a failure which can not be remedied in the field under fire, or without expert assistance or machine-shop facilities.

b. Temporary, due to—

- (1) Failure of some part of the rifle of which a duplicate is carried.
- (2) Faulty ammunition.
- (3) Improper care of the rifle.
- (4) Faults of the automatic rifleman.

17. Causes.—*a. Dirt.*—Natural fouling incident to firing and also to careless cleaning.

b. Insufficient oil.—From failure to oil and because of oil burning up during firing.

c. Extraneous matter in working parts.—Due to poor cleaning, brass chipped from cartridges, breakages, blown primer, etc.

d. Improper assembly of rifle.—Gas ports not registered, middle prong of sear spring riding on one wall of sear carrier, etc.

e. Breakages.—Due to wrong assembly, oversize or undersize parts, burrs, incorrect heat treatment, overheating of parts incident to firing, etc.

f. Burred parts.—Due to improper assembly, use of force, dirt, grit, and foreign matter in mechanism.

g. Magazine troubles.—Due to bent or dented magazines, worn magazines, catch notch, foreign matter, such as blown primer, between lips of magazine and top carriage.

h. Faulty ammunition.—Failure of primer of charge or dented cartridges.

i. Excessive play in parts.—Due to wear in disassembling parts not supposed to be disassembled, as removing barrel from receiver.

j. Ruptured cartridges.—Due to excessive head space. Head space is the distance between the face of the bolt and the shoulder of a standard steel test cartridge. If excessive head space exists when the cartridge is chambered properly, the cartridge case will be forced against the walls of the chamber at the instant of explosion. The cartridge case base will be driven to the rear as it is not supported by the bolt. This results in rupture about one-half inch from the base of the cartridge. In effect, the action during the period of gas pressure within the cartridge case is the same as if the chamber gripped all the outer surface of the cartridge case except the part about one-half inch from the head. The pressure within the cartridge case being approximately 50,000 pounds per square inch, the ungripped portion of the case is torn from the gripped part and forced back against the face of the bolt. (The case is never pulled apart by the extractor.)

18. Method of reducing stoppages.—Temporary stoppages have been divided into four positions, dependent upon the position where the bolt stops. The position of the stoppage is

determined by pulling the operating handle to the rear until it strikes the hammer pin. Boundaries of the positions are—

a. First position, mechanism and operating handle fully closed.

b. Second position, operating handle strikes hammer pin anywhere from fully closed to a point where operating handle plunger pin rides over raised shoulders on ribs of operating handle guideway.

c. Third position, operating handle strikes hammer pin anywhere from second position to a point directly over "F" of change lever setting.

d. Fourth position, operating handle strikes hammer pin anywhere between third position and rear.

19. Explanation of stoppages.—*a. First position.*—(1) *Failure to feed.*—Usually traceable to magazine trouble. An obstruction (usually a blown primer) between lips of magazine and top cartridge prevent the new cartridge from being engaged on the feed rib and causes the bolt to go home on an empty chamber. The same stoppage occurs when the magazine catch notch becomes so worn as to permit the magazine to drop down slightly and also when the magazine catch breaks, or when the magazine is not pushed clear up in magazine opening.

(2) *Failure to fire.*—Repeated failure to fire is usually due to a broken or short firing pin. Frequently the beginner will mistake a misfire, due to an obstruction between the face of the bolt and the breech, for one due to a broken firing pin. He should remember that the latter is a first-position stoppage and the former a second-position stoppage. A misfire due to a broken firing pin will not show any indentation on the primer. The second-position stoppage almost invariably shows a slight indentation.

(3) *Insufficient gas.*—A stoppage in the first position with an empty case in the chamber is due to insufficient gas, which in turn may be due to the gas ports not being properly registered or being partially clogged, or to excessive friction because of lack of oil and a dirty chamber.

b. Second position.—A failure to close will usually be caused by an obstruction lodging between the face of bolt and the breech, thus holding firing pin away from primer. The primer will be slightly dented. This stoppage is typical. When the

piece stops in the second position always look for an obstruction either on the face of the bolt or in breech recess where bolt and receiver join; the most frequent obstruction is the blown primer, but often it is difficult to determine, as frequently it drops off as the bolt is drawn back. If the stoppage recurs, it is certain that an obstruction is in the rifle between the face of the bolt and the breech or between the bolt lock and receiver top plate.

c. Third position.—(1) *Ruptured case.*—This stoppage is due to excessive head space. When the immense pressure following the ignition of the charge is taken up by the cartridge case, the latter, not being properly supported by the bolt, will rupture about one-half inch from the base. The short end at the base must then be extracted and the larger portion of the case will remain in the barrel. A temporary correction for such a stoppage is to clean and oil the chamber thoroughly and oil the cartridges.

(2) *Broken firing pin.*—This stoppage is caused by the end of a broken firing pin protruding through the firing-pin hole in the face of the bolt. The cartridge is then kept from sliding under the extractor as the bolt moves forward and a third-position stoppage will result. The cartridge will show an abrasion near the base. To remedy this stoppage the firing pin must be replaced.

(3) *Mechanism wedged fast in third position.*—This is a rare stoppage. The slide can not be moved forward nor backward. It occurs when any obstruction gets between one of the bolt supports and the bolt lock. As the slide is driven to the rear the bolt lock is wedged fast by the obstruction. This stoppage has been caused by a blown primer or by a piece of metal broken off the rear of firing-pin channel wall. It should be reduced in a properly equipped shop.

d. Fourth position.—(1) *Failure to extract.*—This stoppage is generally due to a dirty or pitted chamber. Usually the empty case will have a small part of the rim pulled off by the extractor. This case can be removed only by the use of the cleaning rod. A few drops of oil in the magazine will ordinarily prevent this stoppage temporarily. The only permanent remedy is a thorough cleaning of the chamber. If the gun develops this stoppage before a large number of rounds has been fired, it is not the fault of the gun, but is due to improper cleaning after the last firing.

(2) *Failure to release sear.*—Another fourth-position stoppage is that in which the piece is cocked and the trigger mechanism will not release the sear when set at "A" or "F." This stoppage is traceable to trouble in the trigger mechanism and may be due to a broken sear spring, a broken or lost connector, an improper assembling of the sear spring, or to any cause which has the effect of moving the middle prong of the sear spring too far to the front with respect to the connector, so that the connector is not cammed under the tail of the sear.

(3) *Wedge primer.*—Another fourth-position stoppage occurs when a blown primer wedges itself between the points of the ejector and the face of the bolt, thereby holding the bolt and mechanism back in the fourth position.

20. Immediate action.—*a. Definition.*—Immediate action is the unhesitating application of a probable remedy for a stoppage.

b. Procedure.—(1) *(a) First step.*—If the rifle does not fire, **TAP MAGAZINE, PULL BACK AND PUSH FORWARD OPERATING HANDLE, AIM, AND TRY TO FIRE AGAIN.** This is the first thing to do in case of any stoppage. It will reduce practically 90 per cent of those that occur.

(b) Second step.—If the rifle still does not fire, pull back operating handle easily to determine position of hammer pin and then drop out magazine.

(2) *(a) First-position stoppages.*—If the stoppage is in the first position, pull operating handle all the way back and watch ejection.

1. If nothing is ejected, change magazine.
2. If loaded shell is ejected, change firing pin.
3. If empty cartridge case is ejected, examine the correct adjustment of gas cylinder, turning to the next larger port if necessary.

(b) Second-position stoppages.—If the stoppage is in the second position, feel for obstruction or burr on face of bolt, in rear end of chamber, in bolt lock recess, or on bolt lock.

(c) Third-position stoppages.—If the stoppage is in the third position—

1. Use ruptured-cartridge extractor to remove front part of ruptured case from the chamber. If no ruptured-cartridge extractor is available, oil and sand nose of bullet, put it in chamber, and let bolt go forward. Pull back operating handle. This will

usually extract the ruptured cartridge. Clean and oil chamber after doing this.

2. If stoppage recurs and is not due to a ruptured cartridge, examine face of bolt for obstruction.

(d) *Fourth-position stoppages.*—If the stoppage is in the fourth position—

1. If slide moved after trigger was pulled, use cleaning rod to push cartridge case from the chamber. If this stoppage recurs, clean ammunition, clean and lightly oil chamber with a rag.
2. If trigger can not be pulled or if the slide does not move when trigger is pulled—
 - (a) See if change lever is set on "Safe."
 - (b) Take out trigger guard and correct fault in the trigger mechanism.

21. *Position stoppage set-ups.*—In the set-ups given below it is assumed the firer has already gone through with the first step of his immediate-action procedure. He should be required to go through with his second step.

a. *First-position stoppages.*—(1) Place blown primer between lips of magazine and top cartridge. Let bolt go forward. Replace magazine.

Answer: Failure to feed—change magazine.

(2) Load gun with dummy cartridge. Let bolt go forward. Replace magazine.

Answer: Failure to fire—change firing pin.

(3) Place empty cartridge case in chamber. Let bolt go forward—replace magazine.

Answer: Insufficient gas—correct gas adjustment.

b. *Second-position stoppage.*—Place blown primer on face of bolt or up in locking recess. Let bolt go forward. Replace magazine.

Answer: Obstruction—remove blown primer.

c. *Third-position stoppage.*—Cock rifle, then place ruptured case in chamber. Replace magazine. Let bolt go forward.

Answer: Call for ruptured-cartridge extractor.

d. *Fourth-position stoppage.*—(1) Cock rifle. Insert empty cartridge case in chamber. Replace loaded magazine. Have man pull trigger.

Answer: Call for cleaning rod—examine extractor.

- (2) Set change lever on "Safe."

(3) Remove connector from trigger guard or have middle prong of sear spring resting on wall of sear carrier.

SECTION VI

MISCELLANEOUS INSTRUCTION WITH THE AUTOMATIC RIFLE

22. Sequence of disassembling and assembling magazine.—

a. Remove the magazine base by raising the rear end until the indentations thereon are clear, and sliding it to the rear. The magazine follower and spring will then fall out.

b. The magazine is assembled in reverse order. It should be noted that the bent end of the follower and the eye of the spring work against the inside of the rear (notched) end of the magazine.

23. Method of operating magazine.—a. To fill the magazine, place the wide end of the magazine filler over the top of the magazine so that the groove in the filler fits over the catch rib of the magazine. Hold the magazine in the same relative position that it occupies in the rifle; that is, with the catch rib toward the operator. Insert a clip of cartridges in the guides provided in the filler, and with the right thumb near the base, strip the cartridges into the magazine. Each magazine will hold four clips.

b. To insert the magazine, press the magazine release and withdraw the empty magazine. Hold the loaded magazine with the base in the palm of the right hand, cartridges pointing to the front. Insert the magazine between the sides of the receiver in front of the trigger guard, and push it home with the right hand. The magazine can be inserted with the mechanism in either the cocked or forward position. It is ordinarily inserted, however, after the rifle has been cocked.

24. Change lever.—The change lever controls the rate of fire. For semiautomatic fire, or a single shot, push the change lever to the forward position, marked "F." For full automatic or continuous fire to the capacity of the magazine, set the change lever in the vertical position against the change lever stop, marked "A." To set the rifle at "Safe," depress the change lever stop and pull the change lever rearward until it covers the change lever stop. This position is marked "S." It will be noted that the change lever stop prevents the accidental setting

of the lever at safe, and at the same time allows a quick change from safe to either full automatic or semiautomatic fire.

25. Spare parts and accessories.—a. General.—The accessory and spare-parts case, M1918, contains the parts and tools to remedy all temporary stoppages. Without them the rifle is liable to be out of action indefinitely; with them the rifle can be returned to action in a few seconds. The importance of knowing what is, and what is not, carried as a spare part should be impressed on all automatic riflemen. It is essential that they know where to find any spare part that may be required. All spare parts must be given their proper names; the use of other names is forbidden. A list of deficiencies should be kept inside each gun box. Spare parts must be kept lightly oiled, and breakages and losses must be reported immediately. Worn or defective parts should not be kept in the accessory and spare-parts case. Care should be taken to see that automatic rifles kept in reserve are in the same condition of readiness for action as those to be used on the firing line. They should not be utilized as a source for obtaining spare parts.

b. Accessory and spare-parts case, M1918, and fabric envelope.—The accessory and spare-parts case should be given the same care as other leather equipment. The contents should always be properly packed. The small fabric envelope is used to hold the recoil spring after it has been coiled up. The remaining spare parts are packed in the large fabric envelope. The accessory and spare-parts case, M1918, contains—

- 1 brush and thong, assembly.
- 1 connector.
- 1 envelope, fabric, large.
- 1 envelope, fabric, small.
- 1 extractor.
- 1 extractor, ruptured cartridge, Mk. II.
- 1 oiler, oval, 3-ounce, with cap and chain.
- 2 pins, firing.
- 1 pin, magazine catch.
- 1 pin, retaining, gas cylinder tube, assembly.
- 1 pin, retaining, trigger guard, assembly.
- 1 spring, extractor.
- 1 spring, magazine catch.
- 1 spring, recoil.
- 1 spring, sear.
- 1 stop, change lever, assembly.

1 tool, cleaning, gas cylinder.

1 tool, combination.

c. Ruptured cartridge extractor, Mk. II.—When a cartridge ruptures it leaves the front end in the chamber, which telescopes over the bullet end of the next cartridge. As the operating handle is pulled back the live cartridge is extracted and ejected, sometimes withdrawing the ruptured fragment with it. In this case the use of the ruptured cartridge extractor is unnecessary. If the ruptured end is not extracted by the following cartridge, cock the rifle and remove the magazine. Insert the ruptured cartridge extractor through the ejection opening and push it forward into the chamber. Let the bolt forward without excessive shock so that the extractor engages the rim of the ruptured cartridge extractor. Draw the operating handle back, extracting and ejecting the ruptured cartridge extractor and the ruptured fragment of the cartridge case.

d. Combination tool.—The small spanner at the head of the combination tool is used to turn the gas cylinder or the flash hider. Barrels which are not excessively tight in the receiver can be removed and replaced by the use of the larger spanner, although shop facilities are necessary for the proper accomplishment of this work, and it should not be attempted by line troops.

e. Gas cylinder cleaning tool.—The gas cylinder cleaning tool is provided for the cleaning of the gas operating mechanism. Using the tool as a hand reamer, insert the smooth end of the body into the cylinder, turning it to the right as it is advanced toward the cylinder head. As soon as it reaches the head, press down and give the tool a few turns to cut the carbon from the inside surface of the head. Withdraw and reverse the tool, using the recess cutter as a gauge to remove the carbon from the recess at the forward end of the interior of the gas cylinder. This part should be thoroughly cleaned, especially that portion near the edge of the operating surface of the cylinder wall. Using the drift point, clean the ports in the barrel, gas cylinder tube, and gas cylinder. Scrape the carbon from the face of the piston with the front cutting edge of the cleaning tool body, and remove the deposit from between the piston rings with the drift point.

26. To remove firing pin without disassembling.—To remove the firing pin, lay the rifle on the table, barrel down,

muzzle to the front. Remove trigger mechanism. Place rim of cartridge under bolt guide. Pull operating handle to rear and hold mechanism back. Steady the cartridge with the thumb and forefinger of the right hand. It may be necessary to exert a slight downward pressure on the nose of the cartridge in order to pull the bolt guide out far enough to free the bolt. Push down on the bolt link, causing the bolt to break at the

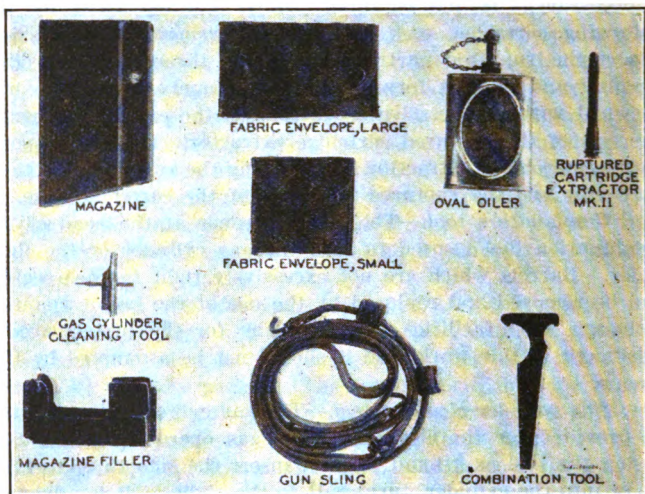


FIGURE 5.—Spare parts and accessories group

bolt-lock pin. Allow the mechanism to go forward until it stops. Change the firing pin. Pull the operating handle to rear again, and push the bolt into position.

27. To remove extractor without disassembling.—Draw back mechanism and insert empty cartridge case between bolt and chamber, exposing the extractor. With the forefinger of the left hand force out the claw of the extractor then place point of cartridge behind the extractor shoulder and pry forward until extractor is free of recess. Remove extractor spring. To assemble extractor, insert short end of extractor spring in hole in the shank of extractor, having the long end of the spring along the slot in the extractor. Insert extractor and spring in end of bolt and push into position.

SECTION VII

CARE AND CLEANING OF THE AUTOMATIC RIFLE

28. General.—The first step in cleaning an automatic rifle is to disassemble it as in field disassembling, and, in addition, remove the gas cylinder from the gas cylinder tube. It should be noted that the action of primer and powder fouling extends to all parts with which the gas comes in contact; the bore, chamber, piston, gas cylinder tube, and the included gas ports. The rifle will not function unless kept free of dirt and sand.

29. Method of ordinary cleaning after firing.—As the receiver of the automatic rifle is of such construction that the bore can not be cleaned from the breech, it is necessary to do so from the muzzle. Care should be taken that the cleaning rod does not rub or wear the muzzle. It is not necessary or desirable to plug the gas port. Use a barrack cleaning rod having a slotted tip, such as the machine-gun cleaning rod. The bore is cleaned and oiled as prescribed for the rifle in Section II, chapter 1.

30. Cleaning the chamber.—During firing a certain amount of oil and dirt accumulates in the chamber, where the heat forms it into a hard coating, akin to carbon, on the walls of the chamber. This coating is easily removed with the chamber cleaning brush while the chamber is hot, but is difficult to remove after it has hardened upon cooling. If it is not removed, cartridges stick in the chamber, and this results in failure to extract. The automatic rifleman should be trained to use the cleaning brush immediately upon cessation of firing, even if this cessation is only for a few minutes. The cleaning brush is introduced through the ejection opening in the receiver, and should be used vigorously. Upon final completion of firing, the brush having been used, the chamber is further cleaned in the process of cleaning the bore, care being taken that water does not remain in the chamber, and that it is finally wiped dry with a patch wrapped around the forward portion of the cleaning brush, and lightly oiled in the same manner.

31. Cleaning gas system.—The gas system consists of the gas cylinder, gas cylinder tube, piston, and the included gas ports. All of these are subjected to primer and powder fouling to the same extent as the bore, and also receive carbon deposits from the burning of oil. To clean these parts of powder and

primer fouling, wipe and scour them thoroughly with rags or patches wet with hot water (preferably soapy), with the aid of the gas cylinder cleaning tool. Using dry rags or patches, thoroughly dry the parts. With the gas cylinder cleaning tool, scrape off any carbon deposits remaining, wipe clean and dry. Oil the parts with a thin film of aircraft machine-gun lubricating oil applied with a clean rag or patch. Do not use an oil can, or lubricate excessively. Excessive oil produces carbon and dirt, and these cause friction.

32. Cleaning remainder of rifle.—*a. Breech mechanism.*—The breech mechanism includes the receiver and all parts contained therein. These parts should be cleaned first with oily rags, and then with a clean, dry rag until thoroughly clean and dry. They should then be wiped with a clean rag slightly saturated with aircraft machine-gun lubricating oil, so as to give to each part a thin film of light oil. This is sufficient for perfect lubrication.

b. Magazine.—*It is imperative that magazines be given the best of care and kept in perfect condition. They should be disassembled, wiped clean and dry and thinly coated with oil as described for the breech mechanism. Much dirt gets into them through careless handling on the ground during range or other firing. They must be kept free from dirt and rust which hinder their operation by making the spring and follower stick. Care must be exercised in the handling of magazines to avoid denting or bending them. The greatest possible care should be taken to prevent any damage to the lips of the magazine or to the notch for the magazine catch.*

33. Points to be observed before, during, and after firing.—*a. Before firing.*

- (1) Test trigger mechanism at safe (A) and (F).
- (2) See that bore is clear and clean.
- (3) Work slide back and forth rapidly several times to see that it moves freely and does not stick.
- (4) Test ejector and extractor with dummy or empty case.
- (5) Verify proper setting of gas port.
- (6) Verify oiling.
- (7) Verify cleaning.
- (8) Examine magazines, and eliminate faulty ones.
- (9) See that accessory and spare-parts case contains oil can full of oil and full complement of spare parts.

b. During firing.

- (1) Keep magazine and chamber protected from dirt.
- (2) Do not allow rifle to become dry.
- (3) Clean bore and gas system frequently.

c. After firing.

- (1) Remove loaded magazine.
- (2) Let bolt forward.
- (3) Wipe out bore and oil rifle.
- (4) Clean rifle thoroughly at first opportunity.
- (5) Replenish spare parts.
- (6) Reload magazines as soon as possible.

34. Care of the automatic rifle in the field.—When advances are being made after the rifle unit has opened fire, the automatic rifleman, before each advance, should lower the magazine, allow the bolt to go forward, and then push the magazine into place. Although this method is slightly slower than rushing with the gun cocked, it will keep the gun in action much longer, since it reduces the probability of dirt getting into the chamber and the magazine.

35. Protection against gas.—*a. When the rifle can not be disassembled.*—When the rifle is exposed to gas and can not be disassembled, proceed as prescribed in paragraph 8*b*, chapter 1. In addition, wipe the magazines and spare parts with an oiled rag and replace them in the belt.

b. When the rifle can be disassembled.—When the rifle can be disassembled, proceed as above, except that the bore should be plugged at each end with an oiled rag and the rifle disassembled, wiped with oil, and reassembled. After a unit has been withdrawn from action, rifles should be cleaned as prescribed in preceding paragraphs and in Section I B, chapter 1.

SECTION VIII

ADJUSTMENTS OF THE AUTOMATIC RIFLE

36. Gas adjustment.—*a. General.*—(1) The rifle should normally be operated on the smallest port, and this setting will never be varied unless the rifle shows signs of insufficient gas. To align the smallest port, screw in the gas cylinder with the combination tool until the shoulder of the gas cylinder is about one turn from the corresponding shoulder of the gas cylinder tube and the smallest circle on the cylinder head is toward the barrel. Lock the cylinder in position. If, upon firing, the rifle shows signs of insufficient gas, try setting the

cylinder one complete turn on each side of the original setting. As soon as the proper setting has been obtained the rifleman will carefully note the position so that he can quickly assemble the cylinder to the proper point without trial.

(2) The larger ports are provided for use in case of emergency, when the action of the rifle has been made sluggish through the collection of dirt and grit, or the lack of oil, and conditions render it impossible for the riflemen to correct these troubles. For this reason the threads should be kept clean and oiled and the cylinder free to turn if necessary. The extractor, ejector, and the chamber of the barrel should be examined and cleaned and defects corrected when possible. Under adverse conditions, and when signs of insufficient gas become apparent, the cylinder should be unscrewed one-third of a turn, thus registering the medium circle and aligning the medium port with the gas orifice. Repeat this operation in order to connect the largest port with the barrel.

(3) Excessive friction or dirt may sometimes prevent the complete forward movement of the bolt. This condition may also be caused by the recoil spring having become permanently set or short through continued use while excessively hot; in such cases, replace the recoil spring.

b. Results of insufficient gas.—(1) Failure to recoil (usually due to a misaligned or excessively clogged gas port, or extremely dirty mechanism).

(2) Failure to eject.

(3) Weak ejection.

(4) Uncontrolled automatic fire (exceptional).

c. Results of too much gas.—(1) Excessive speed, causing pounding.

(2) Excessive heat in gas operating mechanism.

SECTION IX

EXAMINATION ON MECHANICAL TRAINING WITH THE AUTOMATIC RIFLE

37. Type questions and answers.—The following questions and answers may constitute the examination on mechanical training:

Q. What is the name of the rifle? **A.** The Browning automatic rifle, cal. .30, M1918.

Q. What type weapon is it? **A.** Shoulder weapon, gas operated, air cooled, and magazine fed.

Q. How is the barrel cooled? **A.** There is no special cooling device. The barrel is merely exposed to the air.

Q. What is meant by gas operated? **A.** All of the functions of the rifle, such as extraction and feeding, are accomplished by a small portion of gas escaping through a port in the barrel and impinging on a piston.

Q. How many rounds are carried in the magazine? **A.** Twenty.

Q. How much does the rifle weigh with sling and without magazine? **A.** Fifteen pounds, eight ounces.

Q. From what positions may the rifle be fired? **A.** From any of the positions used with the service rifle.

Q. What is the best rate of fire? **A.** Semiautomatic fire at the rate of 40 to 60 shots per minute.

Q. What is meant by semiautomatic fire? **A.** Squeezing the trigger for each shot that is fired.

Q. How is the ammunition for the automatic rifle carried in the squad? **A.** The automatic riflemen carry three magazines each until entry into the combat zone. Upon entering the combat zone the automatic riflemen are issued six additional magazines, and other members of the squad, except the rifle grenadier, are issued one magazine each.

Q. How is the examination on disassembling and assembling of the automatic rifle conducted? **A.** (Man being examined disassembles and assembles the rifle, naming parts.)

Q. How is the examination on disassembling and assembling of the trigger mechanism conducted? **A.** (Man being examined disassembles and assembles trigger mechanism, naming each part.)

Q. What care must be taken of the magazines? **A.** The magazines must be given the best of care and kept in perfect condition. They will be kept cleaned and well oiled. They will not be dented or bent.

Q. How are the magazines filled? **A.** By placing the magazine filler over the magazine and loading four clips in the same manner as in the service rifle.

Q. How are the magazines loaded into the rifle? **A.** (Man being examined loads rifle and releases magazine.)

Q. What do the letters "F. A. S." on the receiver mean? **A.** The letter "F" means semiautomatic fire; the letter "A" means automatic fire; and the letter "S" means safety.

Q. Why should the accessory and spare parts kit be carried? **A.** Because it contains equipment which is necessary to keep the rifle in action.

Q. How is the firing pin removed without disassembling the rifle? **A.** (Man being examined shows how it is done.)

Q. How is the extractor removed without disassembling the rifle? **A.** (Man being examined shows how it is done.)

Q. Why does the rifle fire single shot when the change lever is turned to F? **A.** Because the lug on the shank of the change lever is turned away from the toe of the connector, allowing the connector to rise until the cam surface on the rear of the head of the connector strikes the cam surface on the sear carrier, thereby forcing the head of the connector out from under the sear.

Q. Why can not the trigger be pulled when the change lever is set on S? **A.** Because the change lever is turned so that the solid portion of the shank of the change lever is struck by the shoulders of the trigger.

Q. What is the first thing to do in case of any stoppage? **A.** Tap the magazine, pull back and push forward the operating handle, aim, and try to fire again.

Q. What is the next thing to do in case you have tried to fire again and the stoppage recurs? **A.** Pull back the operating handle slowly until it strikes the hammer pin and see what is the position of the stoppage; drop out the magazine; then apply immediate action.

Q. What are the three stoppages in the first position? **A.** Failure to feed, failure to fire, and insufficient gas.

Q. What things may cause failure to fire in the first position? **A.** Defective ammunition, broken firing pin, weak recoil spring, and too much friction.

Q. What usually causes failure to feed? **A.** Magazine trouble.

Q. How can you tell when the rifle is not getting enough gas? **A.** The rifle will fire but the bolt will not go to the rear.

Q. If your rifle is giving you trouble, due to failure to extract, what is probably the trouble? **A.** The chamber of the rifle has not been properly cleaned.

Q. In what way does cleaning the automatic rifle after firing differ from cleaning the service rifle? **A.** It is necessary to clean the piston, gas cylinder, chamber, and magazines, as well as the bore.

Q. What solution is used to remove powder and primer mixture fouling from barrel? **A.** Soda ash solution or hot soapy water.

Q. How is soda ash solution prepared? **A.** Dissolve one-half pound of soda ash in 1 gallon of boiling water.

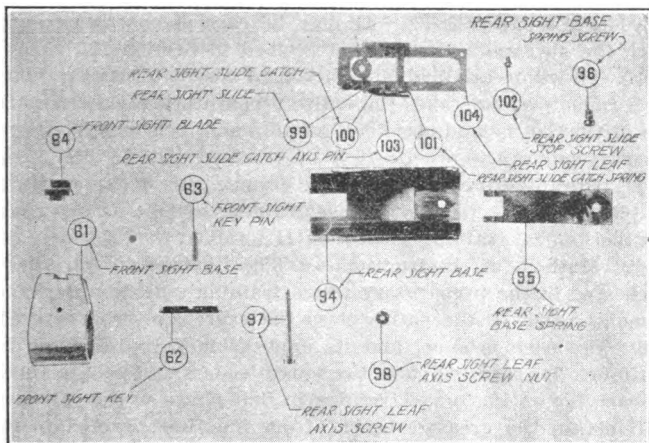


FIGURE 6.—Sight group

Q. What solution is used to remove metal fouling from barrel? **A.** Metal fouling solution.

Q. How should the rifle be oiled? **A.** The rifle should be oiled by wiping a thin film of aircraft machine gun lubricating oil over all parts after cleaning. While firing in the field a light film of oil should be placed on the working parts, especially points where a great deal of friction occurs.

Q. Why can not the barrel be removed and cleaned from the breech? **A.** It is very difficult to replace the barrel as tightly as it should be and as soon as the barrel works loose the rifle will develop head-space trouble. When replacement is necessary it should be turned in.

SECTION X

PREPARATORY RANGE TRAINING

38. Object.—Preparatory range training provides instruction and drill for the soldier, prior to firing with live ammunition, in the correct methods of shooting the automatic rifle. Combined with previous experience in handling the service rifle, and the mechanical instruction covered in preceding sections, it enables him to go to the range well prepared.

39. When taken up.—Preparatory range training precedes 1,000-inch range practice. It may be carried on concurrently with the mechanical training prescribed in Section II.

40. To whom applicable.—Each man who is to fire the 1,000-inch range practice takes the entire preparatory range training. No distinction is made between recruits and men who have previously had range practice.

41. Organization of class.—The organization of the company or platoon for preparatory range training will be as described for mechanical training in Section II.

42. Method of instruction.—*a.* The instructor introduces each step in the preparatory range training by explaining and demonstrating to the entire class the exercises to be covered, tells why each is done, and its application to automatic rifle training. He then instructs the squad leaders as to the manner of carrying on the squad training in that phase so that all men will obtain the greatest benefit from the time devoted to instruction.

b. Each squad leader leads his squad to its assigned area and conducts the work in the phase of preparatory range training that has just been demonstrated and explained.

c. Work in the squad is carried on by the coach and pupil method, so that men coach each other when not under the instruction of an officer or noncommissioned officer. A general description of this method is prescribed in chapter 1.

d. The instruction of each man continues until he understands and is able to explain each point in his own words.

e. A record of each man's work is kept by the squad leader on the blank form shown in paragraph 81*b*. As squad leaders deem certain men proficient, they examine them, and report their qualifications to the platoon leader.

f. A separate record of each man's work is also kept by the platoon leader on another copy of the same form.

g. Exactness in detail in all parts of this training is the object of each man. When carrying out any phase of the training he will have a coach beside him to watch for and correct errors.

43. Equipment.—Company commanders issue sufficient spare automatic rifles, if available, to provide an average of one for each three men engaged in preparatory range work. The additional equipment required for preliminary range work with each automatic rifle consists of a sandbag and one set of the apparatus prescribed for the rifle in Section IV, chapter 1. The equipment needed by the instructor during his talk is an automatic rifle and the additional equipment mentioned above.

44. Preparatory training.—There are seven steps in the preparatory range training. The first four steps are taken up in the sequence shown below. Instruction in the fifth and sixth steps may be given concurrently with the first four or at any time during the training. The examination is given after all the other steps have been completed.

1. Sighting.
2. Positions.
3. Trigger squeeze.
4. Rapid fire.
5. Effect of wind, sight-setting and sight-changing exercises.
6. The score book.
7. Examination.

a. Sighting.—(1) The rear sight on the automatic rifle consists of a large aperture in a small disk. It is graduated for elevation in even hundreds of yards. The sight is set by placing the index line on the rear sight slide opposite the index mark indicating the desired range. No wind gauge is provided. This necessitates holding to the right or left to compensate for wind.

(2) The alignment of the sights alone, and on a bull's-eye in sighting, is as prescribed for the rifle in Section VI, chapter 1. Because of the large aperture, a little difficulty may at first be encountered in centering the top of the front sight. As the eye becomes accustomed to the large sight it will be found that

the front sight centers itself automatically. The soldier must look through the aperture and not at it and the eye must be focused on the target and not on the front sight. The aperture and disk will then appear somewhat blurred. The top of the front sight is aligned in the middle of the blur. Gradually the centering of the front sight in the aperture becomes automatic and ability to take quick aim is increased. The large rear sight is necessary in order to readily pick up the target and keep it in view when firing rapidly.

(3) Exercises with the sighting bar as prescribed for the rifle in Section VI, chapter 1, may be included in the work on sighting or omitted at the discretion of the senior instructor.

(4) The second and third sighting exercises prescribed for the rifle in Section VI, chapter 1, will be carried out with the automatic rifle.

b. Positions.—(1) The provisions of Section VII, chapter 1, relative to positions and position exercises as modified in the following subparagraphs apply to and will be observed in automatic rifle training, excluding, however, the standing position and use of the aiming device.

(2) In all firing positions the soldier is taught to keep his eye as close to the rear sight as possible. Due to the lack of recoil the eye may be placed against the rear sight without danger.

(3) The soldier is taught to use the gun sling in all positions and at all times, for, since the automatic rifle is heavier and is fired more rapidly than the service rifle, it will be correspondingly more difficult to hold steadily except that use of the sling may be optional in the prone with a rest position.

(4) The particulars in which the positions with the automatic rifle differ from those with the service rifle are—

(*a*) *General.*—The automatic rifle will not be fired in the left-hand position.

(*b*) *Prone.*—The body of the firer is placed directly behind the rifle, and not at an angle. This is permitted by the shortness of the stock.

(*c*) *Prone with sandbag rest.*—The gas cylinder tube is supported by the sandbag. The hand and forearm of the firer do not touch the sandbag. When first adjusted to the firer, the sandbag should be too high; that is, high enough so that the aim of the firer will not be lower than the top of the bull's-eye

on the target. Further adjustment is made by pushing down on the barrel until the sights are aligned on the proper place on the target. Any tendency to have the sandbag too low must be promptly checked by the coach.

(5) All positions must be so comfortable and steady that after each shot the automatic rifle will come back to the same point on the target. In practicing this, the soldier takes position, sights on the target, closes his eyes, and holds easily. On opening the eyes, if the position is correct, the gun is still aimed on the target. This is essential to maintaining a rate of fire of 40 to 60 shots per minute. These exercises and the positions as prescribed in chapter 1, excluding the standing position and use of aiming device, will be carried out with the automatic rifle.

(6) *Assault fire position.*—In this position, the automatic rifle is held with the butt under the right armpit, clasped firmly between the body and the upper portion of the arm, the sling over the left shoulder. (See fig. 10.)

45. Trigger squeeze.—*a.* The proper method of squeezing the trigger is the same as prescribed for the rifle in chapter 1. With the automatic rifle it is necessary to continue the squeeze after the shot is fired in order that two shots will not be fired automatically.

b. Trigger squeeze exercises requiring practical work need not be carried out during preparatory range training with the automatic rifle if the men under instruction have gone through this phase of training with the service rifle and thoroughly understand it.

46. Rapid fire.—*a.* Rapid-fire exercises enable the soldier to gain dexterity in the manipulation of the automatic rifle. Efficient manipulation is an important factor in automatic rifle firing.

b. Rapid-fire exercises are held at short ranges with "D" targets in frames as aiming points. The exercises include observance of the principles of sighting, positions, and trigger squeeze, as taught in the preceding exercises.

c. During firing it is essential that every man count his shots, so that he will know when the last one has been fired and the magazine is empty. This prevents sending the bolt home on an empty chamber, which would necessitate pulling back the operating handle and so wasting time. During preparatory

range practice, the bolt being left in the forward position, and the change lever being set at "F," firing is simulated by pressing the trigger until it clicks for each shot.

d. When the last shot in the magazine is fired, the bolt being in the rearward position and the rifle held horizontally, the



FIGURE 7.—Prone with sandbag

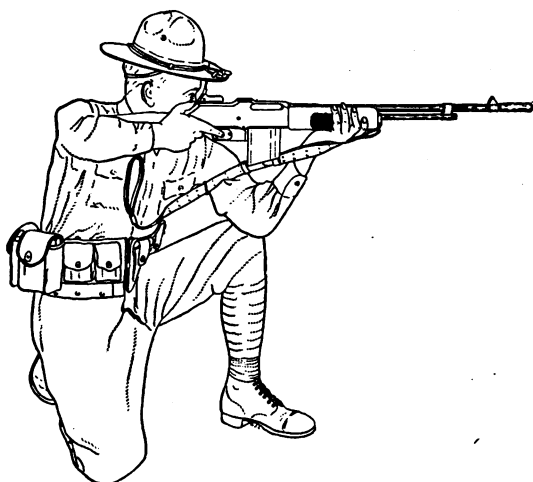


FIGURE 8.—Kneeling position

automatic rifleman pushes the magazine release with his right thumb and the magazine falls out of its own weight.

e. Full magazines are so placed in the belt that when grasped and carried forward by the right hand the long portion will be to the rear. Thus they may be readily inserted in the magazine opening in the receiver.



FIGURE 9.—Sitting position



FIGURE 10.—Assault fire position

f. Empty magazines are picked up and placed in the magazine belt.

g. Each soldier changes his own magazines. He must be able to do it in two to four seconds while in any position. He tests all magazines before firing to see that they will fall out of their own weight when empty.

h. These operations are taught as a drill, in which the following points should be carefully observed:

(1) Magazines are placed in the magazine belt so that, when grasped and carried forward by the right hand, the long portion will be to the rear.

(2) Each man should count his shots.

(3) Magazines are dropped out after the twentieth shot.

(4) All magazines to be used fall out of their own weight when empty.

(5) The new magazine is drawn from the belt and placed in the receiver with one rapid, smooth movement.

(6) Empty magazines are replaced in the belt. The drill is conducted as indicated in Figure 11.

47. Effect of wind, sight-setting and sight-changing exercises.—*a. General principles.*—The information contained in Section X, chapter 1, with reference to effect of wind, light, elevation rule, canting of rifle, sight-setting and sight-changing exercises, as modified below, is applicable to firing with the automatic rifle.

b. Effect of wind.—Wind from either side blows the bullet out of its path. This movement must be allowed for by aiming off toward the side from which the wind is blowing. The amount the bullet will be blown from its path depends on the force and direction of the wind and the distance to the target. During range practice the amount to aim off after the first shot is fired is readily determined from the position of the spotter on the target.

c. Wind rule.—The approximate windage correction for the first shot can be determined by applying the wind rule formula described below:

The square of the range R (expressed in hundreds of yards), multiplied by the velocity of the wind V , and divided by 10, equals the number of inches to aim off for a 3 or 9 o'clock wind. Stated as a formula the rule is—

$$\frac{R^2 \times V}{10} \text{ or } \frac{R \times R \times V}{10}$$



Firing.



Pressing in Magazine Release with Right Thumb



Magazines Should be Sufficiently Smooth to Drop Out



New Magazine



Reaching for Old Magazine



Replacing Old Magazine in Belt Before Refiring

FIGURE 11.—Changing magazine drill

Example:

Range----- 500 yards
 Velocity of wind (estimated) - 8 miles per hour
 Direction of wind----- 3 o'clock

Required: Number of inches to aim off.

Solution: $\frac{R \times R \times V}{10}$ equals number of inches to aim off.

"R" equals 5 (range expressed in hundreds of yards). "V" equals 8 (velocity of wind in miles per hour). Therefore $\frac{R \times R \times V}{10}$ equals $\frac{5 \times 5 \times 8}{10}$ equals 20 inches to aim off.

48. The score book.—*a.* The use by the soldier of a score book to keep a personal record of the results and conditions of his firing throughout the period of range practice is as necessary with the automatic rifle as with the service rifle. The same score book as prescribed for the rifle (ch. 1) is used for the automatic rifle.

b. The use of the score book for the automatic rifle is in general as prescribed for the service rifle in the score book. (Par. 46, ch. 1.) Certain variations are noted as follows:

(1) The aiming point used for each shot is plotted in the column headed "W. G." Upon completion of the score no entry is made after the words "zero windage." In place of zero windage the aiming point for the rifle at that range is determined, and its location indicated by an "X" on the recording target.

(2) In the table of wind allowances, in the score book, the column headed "Inches" indicates the distance to aim off with the first shot for any direction and velocity of wind.

c. Exercises in plotting data in the score book, as prescribed in paragraph 47, chapter 1, may be given at the discretion of the instructor.

49. Examination.—Preparatory range practice is concluded by an examination consisting of the following questions. The questions are answered by the soldier in his own words.

Q. Explain the difference between sighting with the service rifle and the automatic rifle. **A.** There is no difference. The rear sight on the automatic rifle has a larger peep. The front sight is centered as in aiming the rifle.

Q. Why is the large peep necessary? **A.** In order that the target can be picked up rapidly and held while firing at a rapid rate.

Q. From what positions may the automatic rifle be fired?

A. It may be fired from any of the positions prescribed for the service rifle.

Q. Demonstrate each position. **A.** (Soldier demonstrates.)

Q. What is the best position from which to fire the automatic rifle? **A.** Because of its weight it should be fired from the prone position with a rest, whenever possible.

Q. Why is it important to use the sling with the automatic rifle? **A.** Because the rifle must be held very steadily in order to fire accurately at a rate of 40 to 60 shots per minute.

Q. When firing semiautomatically at the rate of 40 to 60 shots per minute, are all shots aimed shots? **A.** Yes, all shots are aimed shots, although it is not possible to aim as carefully as in slow fire. The correct position is so steady that after each shot the gun will return to the target and it is necessary only to glance along the sights to see that they are properly aligned.

Q. Explain the trigger squeeze with the automatic rifle. **A.** The trigger squeeze with the automatic is the same as with the rifle. However, the trigger must be squeezed all the way to the rear and released before the next shot can be fired.

Q. Explain why it is necessary to count every shot. **A.** It is necessary to count every shot so that the trigger will not be pulled when the magazine is empty. This saves time, because it avoids the necessity of recocking the piece.

Q. How are the magazines changed while firing? **A.** (Soldier demonstrates.)

Q. How is the rear sight set? **A.** The rear sight is set by placing the line on the rear sight slide opposite the range. (Soldier demonstrates.)

Q. How is the automatic rifle adjusted for wind? **A.** There is no adjustment for wind. It is necessary to hold to the right or left.

Q. Demonstrate how to change magazines in the prone position. **A.** (Soldier demonstrates.)

Q. How much, and to which side, is it necessary to aim off at 500 yards to allow for an 8-mile, 3 o'clock wind? **A.** Twenty inches to the right.

Q. How are data entered in the score book? **A.** (Soldier demonstrates and explains.)

SECTION XI

RANGE PRACTICE

50. Purpose.—Range firing is intended to give the soldier actual practice in the use of his automatic rifle with live ammunition under conditions which permit the result of each shot to be determined. He puts to use the knowledge previously acquired, gains confidence and the ability to shoot accurately and rapidly, and finally by firing for record establishes his classification as an automatic rifleman.

51. Preliminary training.—Before a soldier is permitted to fire the automatic rifle on the range, he shall have completed a thorough course in rifle marksmanship, except where he belongs to an organization that does not include service rifles in its equipment. The soldier must also thoroughly understand disassembling and assembling, functioning, care and reduction of stoppages as outlined in Sections IV to VII; and have completed preparatory range training as outlined in Section X.

52. Applying principles previously learned.—The principles taught and the methods practiced during preparatory range training and mechanical training must be applied in range practice with live ammunition. The points outlined in paragraphs 53 to 58, inclusive, will also be observed.

53. Flinching and trigger squeeze.—Lack of recoil practically eliminates flinching with the automatic rifle. Nevertheless, it is important to squeeze the trigger properly.

54. Holding during movement of slide.—It is important to hold steadily and aim accurately, not only before the trigger is squeezed, but also during the time that it takes the slide to complete its forward movement. To the beginner the forward movement of the slide seems to throw the rifle completely off the target, but experience in firing will prove that this is a negligible factor.

55. Maintaining prescribed rate of fire.—*a.* During timed or rapid fire it is essential to maintain the prescribed rate of fire. Therefore the trigger must be squeezed properly and magazines changed without loss of time. The first empty magazine of a 2-magazine score need not be replaced in the belt until after the targets have been pulled down.

b. Accuracy must never be sacrificed for speed. It is always better to fire a few well-aimed shots than many unaimed ones.

56. Blackening sights.—The front sight of the automatic rifle will be blackened for all range firing.

57. Pads.—The use of elbow pads is recommended. Shoulder pads are unnecessary.

58. Coaches and coaching.—*a.* The coach and pupil method of instruction used in preparatory range training is adhered to during range practice, except when firing for record.

b. Whenever a man is in a firing position, except in record practice, a coach will be placed beside him to watch him and point out his errors. The coach watches the man. A coach who watches the target is of no assistance to the man firing.

59. Kinds of target practice.—Target practice with the automatic rifle is divided into—

a. 1,000-inch range practice, which is carried out on specially constructed or improvised 1,000-inch ranges.

b. Known-distance practice on the class "A" rifle range at 200, 300, 500, and 600 yards.

c. Special firings, which include assault fire and antiaircraft fire.

60. Purpose of 1,000-inch firing.—The purpose of 1,000-inch range firing is to give the soldier, prior to known-distance firing, a certain amount of training with a target of such nature that his errors may be readily detected and pointed out to him. Here he has practiced in reloading, aiming, holding, squeezing the trigger, assuming correct positions, executing rapid fire, manipulating magazines, and reducing such stoppages as may occur.

61. Targets for 1,000-inch firing.—Automatic-rifle targets, Nos. 1 and 2, described in TR 1340-A, are used on the 1,000-inch range when available. If not available, the machine-gun 1,000-inch target or any paper or cardboard target, approximately 3 by 5 feet, ruled into 2-inch squares, can be used.

62. Kinds of firings carried out on 1,000-inch range.—*a.* Firing on the 1,000-inch range includes—

(1) Firing to align front sight.

(2) Slow fire.

(3) Timed or rapid fire.

b. The tables to be fired will be found in paragraph 75. These tables are meant as a guide. The amount of 1,000-inch firing to be given and the number of shots to be fired at each range will be such as to conform to the authorized ammunition allowances.

c. For 1,000-inch firing an initial setting of 400 yards on the rear sight will be approximately correct. The exact sight setting is determined by actual firing.

63. **Firing to align front sight.**—*a.* This firing, authorized in Table I, paragraph 75, is intended to aid the soldier in aligning the front sight of his automatic rifle. As the Browning automatic rifle, cal. .30, M1918, is not equipped with a wind gauge on the rear sight, provision has been made whereby the front sight may be tapped to the right or left so that it will not be necessary to aim off on account of a defective alignment of the sights. The 1,000-inch range is the best place to do this because the aiming point is small and well-defined and atmospheric conditions will have no effect on the flight of the bullet.

b. In firing this table, the soldier aims at the bottom edge of a paster. He fires all five shots of a string semiautomatically and very carefully, using exactly the same aiming point for all five. The center of the resulting shot group indicates how much and in what direction to move the front sight.

c. If the shot group is to the right of the aiming point, move the front sight to the right; if to the left, move the front sight to the left. It should be borne in mind that to move the strike of the bullet 1 inch at a range of 1,000 inches requires a movement of the front sight of only twenty-five one thousandths of an inch.

d. When the same rifle is being used by a group, the firing of Table I and alignment of the front sight will be executed by any soldier in the group who has qualified in the record course with the automatic rifle. If the group contains no such man, the firing and alignment of the sight will be executed by any member of the group holding the highest qualification with the service rifle.

e. The front sight of the rifle must not be moved after it is once zeroed, except by authority of an officer.

64. **1,000-inch slow fire.**—This practice is prescribed in Table II, paragraph 75. If time and ammunition are available, after completing the entire 1,000-inch course once, much benefit may be obtained from firing this table for a second time and also Table III, paragraph 75, timed or rapid fire.

65. **1,000-inch timed or rapid fire.**—*a.* The fire prescribed in Table III, paragraph 75, comprises concentrated and distributed fire delivered within time limits. It gives the soldier practice in the delivery of timed or rapid fire and also in distribution.

b. In concentrated fire (at the single paster) the shot group should be small enough so that the circumference of a circle 4 inches in diameter will contain it.

c. In distributed fire, the soldier is taught to put one shot in each of the distributed pasters and to place a hit at least every 2 inches along the solid line of pasters. He should understand that every inch on this target, in both elevation and deflection, represents 1 yard at 1,000 yards or one-half yard at 500 yards.

66. Known-distance practice.—*a.* Known-distance practice is divided into two phases; instruction practice and record practice. Three courses (A, B, C) for known-distance practice are laid down in paragraphs 76, 77, and 78. Course A includes firing up to 600 yards. The other two are designed to fit conditions where the firing of course A is not practicable.

b. Before known-distance firing is taken up, the soldier must have completed the course of 1,000-inch firing.

c. The principles taught during mechanical training, preparatory range training, and 1,000-inch firing must be observed during known-distance practice.

d. If the prior training has been thorough, the score obtained on the known-distance ranges will be good. If the training has been poor or insufficient, known-distance practice will invariably reveal the deficiencies.

67. Instruction practice, known-distance course.—*a.* Instruction practice on the known-distance range gives the soldier an opportunity to apply the principles of automatic rifle marksmanship by firing with live ammunition, at fixed distances, on clearly defined targets.

b. The order of firing is laid down in the tables of instruction practice for each course. This practice is designed to fit the usual case and is meant to serve as a guide. The procedure may be changed by the officer in charge of the firing when unusual local conditions make such action advisable.

c. The amount of instruction practice is not limited to that prescribed in the tables. Such additional practice as time and ammunition allowance permit will be given.

d. Each person will complete instruction practice before proceeding with record practice.

e. The amount of instruction practice to be given and the number of shots to be fired at each range will be such as to conform to the authorized ammunition allowances.

68. Record practice.—*a. Known-distance course.*—(1) Following instruction practice, the soldier fires the record practice as a test of his ability as an automatic rifleman and for qualification.

(2) The required firing is laid down in the tables of record practice for each course.

(3) When record practice is once begun, it is carried to completion before any other practice is permitted.

(4) Instruction and record practice will not be conducted simultaneously.

(5) Procedure and rules governing record practice are prescribed in order to secure a uniform test throughout the service.

b. Procedure.—The provisions in Section XV, chapter 1, covering the procedure governing record practice with the rifle apply to automatic-rifle record practice with the following changes affecting rapid fire:

(1) The firer is already in the prescribed position at all ranges before the target appears.

(2) The firer reloads with a second magazine taken from the belt.

(3) All references to 10 shots in rapid fire with the rifle will be understood to mean 40 shots when applied to rapid fire with the automatic rifle.

c. Rules.—The provisions in Section XVI, chapter 1, covering the rules governing record practice for the rifle apply to automatic-rifle record practice with the following changes:

(1) No test of the trigger pull is required before firing.

(2) Cleaning is permitted at any time.

(3) The provisions relative to misfires and disabled rifles during rapid fire do not apply to the automatic rifle. In the event of a stoppage during rapid fire with the automatic rifle the officer in charge investigates the stoppage and authorizes the score to be fired again if the stoppage is due to faulty ammunition or to failure of some part of the gun, not due to fault of the firer.

69. Assault fire.—*a.* After the completion of record practice, and subject to authorized ammunition allowances, all men who have completed record practice, course A, with the exception of antiaircraft troops, will fire the table given in paragraph 79.

b. The target is a screen 10 feet long and 3 feet high, with three prone silhouette targets, placed 1 yard apart, directly in

front of the screen. After the firing each soldier marches up to the target to examine the effects of his firing.

c. In firing this table, the automatic rifle is held with the butt under the right armpit, clasped firmly between the body and the upper portion of the arm, the sling over the left shoulder.

70. Antiaircraft fire.—Instruction in antiaircraft fire will be carried out in accordance with the prescribed regulations on antiaircraft marksmanship.

71. Permanent range personnel.—The provisions of paragraphs 67, 68, and 69, chapter 1, apply when ranges are in use for automatic rifle firing.

72. Uniform.—The uniform to be worn during range practice will be prescribed by the commanding officer.

73. Equipment.—The automatic rifleman's belt will be worn during all range practice.

74. Safety precautions.—*a.* Magazines will not be inserted in automatic rifles in rear of the firing line.

b. All automatic rifles on the range and not in actual use will have the bolt in the forward position and no magazine in the magazine opening.

c. After firing and before leaving the firing point, all persons will be required to remove the magazine and then let the bolt forward.

75. 1,000-inch course.

TABLE I

Position	Target	Rest	Kind of fire	Shots	Time
Prone.....	A. R. No. 1.	Sandbag or bipod.	S-A; strings of 5 shots.	10	No limit.

TABLE II

Position	Target	Rest	Kind of fire	Shots	Time
Prone.....	A. R. No. 1.	Sandbag or bipod.	S-A.....	10	No limit.
Sitting.....	do.....	None.....	S-A.....	5	Do.
Kneeling....	do.....	do.....	S-A.....	5	Do.

TABLE III

Position	Target	Rest	Kind of fire	Shots	Aiming point	Time
Prone	A. R. No. 2.	Sandbag or bipod.	S-A	5	Upper paster	8 seconds.
Do	do	do	S-A	10	Row of separated pasters.	15 seconds.
Do	do	do	S-A	¹ 20	Solid row of pasters.	30 seconds.

¹ 2 magazines of 10 shots each.

76. Course A.—a. Instruction practice.—Known-distance firing begins with instruction practice. The minimum course is prescribed in Tables I, II, and III.

TABLE I

Range	Position	Target	Rest	Kind of fire	Shots	Time
300	Prone	B	Sandbag or bipod.	S-A	10	No limit.
500	do	B	do	S-A	10	Do.
600	do	B	do	S-A	10	Do.

TABLE II

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	D	None	S-A	¹ 5	No limit.
200	do	D	do	S-A	² 20	40 seconds.
300	Prone	D	Sandbag or bipod.	S-A	¹ 5	No limit.
300	do	D	do	S-A	² 20	45 seconds.
500	do	D	do	S-A	¹ 5	No limit.
500	do	D	do	S-A	² 20	55 seconds.

¹ Marked after each shot.

² 2 magazines of 10 rounds each will be used.

TABLE III

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	D	None	S-A	¹ 40	1 minute, 10 seconds.
300	Prone	D	Sandbag or bipod.	S-A	¹ 40	1 minute, 20 seconds.
500	do	D	do	S-A	¹ 2 40	1 minute, 40 seconds.

¹ 2 magazines of 20 rounds each.² 2 sighting shots, marked after each shot, will precede this score.*b. Record practice.*

TABLE IV

Range	Position	Target	Rest	Kind of fire	Shots	Time
300	Prone	B	Sandbag or bipod.	S-A	10	No limit.
500	do	B	do	S-A	10	Do.
600	do	B	do	S-A	¹ 10	Do.

¹ 2 sighting shots will precede the score at 600 yards.

TABLE V

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	D	None	S-A	40	1 minute, 10 seconds.
300	Prone	D	Sandbag or bipod.	S-A	40	1 minute, 20 seconds.
500	do	D	do	S-A	¹ 40	1 minute, 40 seconds.

¹ 2 sighting shots, marked after each shot, will precede the score at 500 yards.**77. Course B.—a. Instruction practice.**

TABLE I

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	B	None	S-A	10	No limit.
300	Prone	B	Sandbag or bipod.	S-A	10	Do.

TABLE II

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	D	None.....	S-A.....	5	No limit.
200	do.....	D	do.....	S-A.....	1 20	40 seconds.
300	Prone.....	D	Sandbag or bipod.	S-A.....	5	No limit.
300	do.....	D	do.....	S-A.....	1 20	45 seconds.

1 2 magazines of 10 shots each.

TABLE III

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	D	None.....	S-A.....	1 40	1 minute, 10 seconds.
300	Prone.....	D	Sandbag or bipod.	S-A.....	1 40	1 minute, 20 seconds.

1 2 magazines of 20 shots each.

b. Record practice.

TABLE IV

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	B	None.....	S-A.....	10	No limit.
300	Prone.....	B	Sandbag or bipod.	S-A.....	10	Do.

TABLE V

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Sitting or kneeling	D	None.....	S-A.....	1 40	1 minute, 10 seconds.
300	Prone.....	D	Sandbag or bipod.	S-A.....	1 40	1 minute, 20 seconds.

1 2 magazines of 20 shots each.

78. Course C.—a. Instruction practice.**TABLE I**

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Prone.....	B	Sandbag or bipod.	S-A.....	10	No limit. Do.
200	Sitting or kneeling..	B	None.....	S-A.....	10	

TABLE II

Range	Position	Target	Rest	Kind of fire	Shots	Time
200	Prone.....	D	Sandbag or bipod.	S-A.....	1 40	1 minute, 10 seconds. Do.
200	Sitting or kneeling..	D	None.....	S-A.....	1 40	

1 2 magazines of 20 shots each.

b. Record practice.—Tables I and II will each be fired once for record.

79. Assault fire.

Range	Position	Kind of fire	Shots	Time
100	Assault fire.....	S-A.....	5	No limit. 1 minute.
100-25	Assault fire (advancing).....	S-A.....	1 20	

1 2 magazines of 10 shots each.

80. Antiaircraft fire.—See the prescribed regulations on antiaircraft marksmanship.

81. Records.—The following records are kept under the direction of the company commander:

a. Record of each automatic rifle.—Each company or similar organization armed with the automatic rifle will keep a record, under the direction of the company commander, of each automatic rifle, which record will show the number of the rifle, date received, number of rounds fired, stoppages, repairs, inspections, and name of soldier to whom issued.

b. Training record.—Training records which show the stages of automatic rifle training through which each member of the

command has passed, and his proficiency therein, will be kept by the squad and platoon leaders under supervision of the company commander.

RECORD OF AUTOMATIC RIFLE INSTRUCTION

Company..... **Platoon**..... **Squad**..... **Date**.....

Name	Mechanical course										Marksmanship course														
	General data	Regulations, classroom	Stripping and assembling	Remove firing pin and extractor	Nomenclature	Functioning	Spare parts	Loading magazines	Immediate action	Care and adjustment	Points to be observed	Inspections	Final examination	Aiming and sighting exercises	Firing positions	Trigger squeeze	Rapid fire exercises	Sight adjustment	Wind allowances	Score book exercises	Assault fire position	1,000-inch firing	Immediate action firing	Instruction practice	Record practice

METHOD OF MARKING

 Fair
  Good
  Very good
  Excellent
  Perfect

c. Individual automatic rifle score books.—Individual score books will be kept by all who fire on the known-distance ranges prescribed herein. Each round fired during known-distance instruction practice and record practice will be recorded in these score books.

d. Records and reports.—See AR 345-1000.

SECTION XII

ADVICE TO INSTRUCTORS

82. Provisions not mandatory.—The provisions of this section are not mandatory but are given as a guide.

83. Methods of instruction for mechanical training.—*a. When trained assistant instructors are available.*—The following method of instruction is suggested when trained assistant instructors are available:

- (1) Commissioned instructor in charge.
- (2) Assistant instructor with each group.
- (3) Instructor makes brief talk leading to particular subject.
- (4) Instructor explains work, imitated by assistant instructors.
- (5) Each member of group imitates.
- (6) Other members of group check the one doing the work.
- (7) Assistant instructors supervise.

b. When trained assistant instructors are not available.—When the instructor in charge is unable to obtain trained assistant instructors, the following method is suggested:

- (1) Commissioned instructor in charge.
- (2) Instructor makes brief talk leading to particular subject.
- (3) Instructor demonstrates and explains work.
- (4) Instructor demonstrates work with one member of each group imitating him.
- (5) Each member of group imitates.
- (6) Other members of group check the one doing the work.

84. Lessons.—Mechanical training is divided into six lessons and an examination. The first five lessons are taken up in the sequence shown below. Instruction in the sixth may be given at any time during the training. The examination is given after all six lessons have been completed.

1. General data, field disassembling and assembling. (Secs. III and IV.)
2. Disassembling and assembling of the trigger mechanism. (Par. 14.)
3. Functioning. (Par. 15.)
4. Stoppages and immediate action. (Sec. V.)
5. Miscellaneous lesson. (Sec. VI.)
6. Care of the automatic rifle. (Sec. VII.)
7. Examination. (Sec. IX.)

a. General data, field disassembling and assembling.—(1) The following equipment is provided for instructional purposes:

(a) Equipment for the instructor:

Automatic rifle.

Accessory and spare parts kit (complete).

Dummy cartridges.

(b) Equipment for the squad: Same as for the instructor.

(2) The instructor covers the following points in his preliminary talk. The first five points are explained in detail in Section III.

(a) Name and type of weapon.

(b) Cooling system.

(c) Operation.

(d) Magazines.

(e) General data.

(f) Positions and rates of fire.

(3) The automatic rifle can be fired from any position prescribed for the service rifle. Due to its weight, it is fired from the prone position from a rest whenever possible. The best results will be obtained when the rate is from 40 to 60 rounds semiautomatic fire per minute.

(4) The instructor, with an automatic rifle in his hands, then points out, names, and describes the various parts externally visible.

(a) Flash hider.

(b) Front sight carrier and blade.

(c) Barrel.

(d) Gas cylinder tube bracket, female (on barrel).

(e) Gas cylinder tube bracket, male (on gas cylinder tube).

(f) Gas cylinder tube.

(g) Gas cylinder (screwed in end of gas cylinder tube).

(h) Gas cylinder lock. (The holes around the head of the gas cylinder have nothing to do with the gas. They are for the use of the combination tool in unscrewing the gas cylinder. There are three circles on the face of the gas cylinder which serve as an index of the gas port that is registered. The gas cylinder is ordinarily set with the smallest circle next to the barrel. This position usually gives enough gas.)

(i) Gas escape holes. (Six small holes at forward end of the gas cylinder tube.)

(j) Front swivel bracket.

- (k) Forearm, wood.
- (l) Forearm screws.
- (m) Ejection opening.
- (n) Gas cylinder tube retaining pin.
- (o) Hammer-pin hole.
- (p) Rear sight.
- (q) Butt stock.
- (r) Butt stock plate.
- (s) Butt plate trap.
- (t) Operating handle.
- (u) Bolt guide. (Small rectangular piece of metal just below operating handle.)
- (v) Change lever.
- (w) Three letters F. A. S.
 - (F. Semiautomatic.)
 - (A. Automatic.)
 - (S. Safety.)
- (x) Trigger guard retaining pin.
- (y) Magazine opening.

(5) The instructor then slowly disassembles the rifle, exclusive of the trigger mechanism and buffer, holding up, naming, and describing each part as he removes it. Attention is called to all cams, lugs, and springs, but their functions are not explained. The piece is assembled in the same manner. After this explanation the instructor again describes, step by step, how to disassemble and assemble the rifle, naming and describing each part as before. One man at each table imitates him. Men should not be permitted to go ahead of the instructor. Assistant instructors keep the backward men up with the explanation.

(6) Steps in disassembling and assembling are taken up as prescribed in Section IV.

(7) When the above demonstration has been completed once, the remaining members of the squad disassemble and assemble the piece, naming and describing each part as it is removed. The other members of the squad stand by them and correct errors. Instructors supervise and assist students and see that mistakes are corrected. They examine men whom they believe to be qualified and report their qualification to the senior instructor.

(8) After all men become thoroughly proficient in disassembling and assembling, if time permits, they may be required to disassemble and assemble the rifle blindfolded. Instructors supervise this instruction to prevent wrong assembly or forcing of parts. Assistance is given if necessary. Any part called for by its right name is furnished to the one performing the work. The members of the squad not performing the work blindfolded may be profitably employed by having other members of the squad place parts of the rifle in their hands so they can not see the parts. This drills the squad in recognizing the parts by sense of touch. The purpose of this instruction is to train the soldier so that he can replace broken parts and reduce stoppages in the dark.

(9) Nomenclature is not taken up as a separate subject. The soldier will become familiar with it during the periods of preliminary instruction.

b. Disassembling and assembling of trigger mechanism.—(1) *Equipment.*—(a) Equipment for the instructor:

Automatic rifle.

Dummy cartridge.

(b) Equipment for the squad: Same as for instructor.

(2) *Explanation.*—(a) The instructor with the trigger mechanism in his hand explains in detail the disassembling and assembling, holding up each part and naming it. Attention is called to all cams and lugs, but their functions are not explained.

(b) The sequence and method of disassembling and assembling the trigger mechanism are taken up as prescribed in paragraph 14.

(c) After the instructor has completed the disassembling and assembling of the trigger mechanism he repeats it, with one man of each group imitating him. This work is carried on until all men are able to disassemble and assemble the mechanism and name each part.

c. Functioning.—(1) *Equipment.*—(a) Equipment for the instructor:

Automatic rifle.

Charts.

Models.

(b) Equipment for the squad: Automatic rifle.

(2) *Lecture*.—(a) The instructor gives a brief lecture explaining in detail the differences between recoil-operated and gas-operated weapons, and the fact that all automatic weapons must have mechanical means for performing the functions of extraction, ejection, feeding, locking the breech while there is a high pressure in the bore, and igniting the cartridge. He defines and illustrates any mechanical terms which he may use. For example, "to cam" is to change the direction of motion of a part by means of sliding contact between two surfaces.

(b) Operations, such as extraction and ejection, are performed by various cams, lugs, and springs, and the energy necessary to perform this work and to overcome friction in the rifle is derived from the explosion of the powder in the chamber.

(c) The instructor explains that these operations have a certain sequence in various weapons; that some of them are concurrent; and that the student will be expected to learn and understand the various operations and the sequence in which they occur.

(d) The use of an assembled rifle, parts of a rifle, drawings and sectional views, combined with motion pictures and wooden models of the trigger and bolt actions, will greatly aid in this explanation.

(e) It is not necessary that the soldier memorize the distances and details of the functioning, but he will be given an approximate idea of these. For example, he should understand that the backward travel of the bolt is very slight when the bolt lock is drawn completely down, but that, on the other hand, the slide moves a considerable distance.

d. *Stoppages and immediate action*.—(1) *Equipment*.—(a) Equipment for the instructor:

Automatic rifle.

Magazine.

Accessory and spare parts kit.

Cleaning rod.

Dummy cartridges.

Broken firing pins.

Empty cartridge cases.

Blown primers.

Front part of ruptured cartridge cases.

(b) Equipment for the squad: Same as for the instructor.

(2) *Preliminary talk*.—The instructor in his preliminary talk covers the following points:

(a) Classes of stoppages. (Par. 16.)

(b) Causes of stoppages. (Par. 17.)

(c) Method of reducing stoppages and boundaries of positions of stoppages. (Par. 18.)

(d) Immediate action. (Pars. 20 and 21.)

e. Miscellaneous.—(1) *Equipment*.—(a) Equipment for the instructor:

Automatic rifle.

Magazine.

Magazine filler.

Accessory and spare-parts kit (complete).

Dummy cartridges.

(b) Equipment for the squad: Same as for the instructor.

(2) The following subjects will be taken up in this lesson and explained as prescribed in Section VI:

(a) Disassembling and assembling of magazine.

(b) Method of filling and inserting magazine.

(c) Spare parts and accessories.

(d) Disassembling and assembling of buffer.

(e) To remove firing pin without disassembling the piece.

(f) To remove extractor without disassembling the piece.

(3) *Procedure for students*.—At the completion of this lecture the same procedure is followed as in the previous lessons.

f. Care of the automatic rifle, and points before, during, and after firing (B. D. A.).—This lesson will be a lecture covering care and cleaning, and points to be observed before, during, and after firing, as prescribed in Section VII.

85. Preparation of schedules.—*a.* The preparation of a schedule for a course of automatic-rifle instruction involves consideration of certain elements:

(1) Time available.

(2) Size of class.

(3) Number of trained assistants.

(4) Facilities; such as, quantity of equipment, number of firing points available, weather probabilities.

(5) Extent of course; whether or not it is to include record firing of course A or less.

b. In the schedule of instruction given in *d* below it is assumed that—

(1) It is desired to fire course A for record.

(2) Trained assistant instructors are available in the ratio of one to each eight men firing the course.

(3) Automatic rifles, accessories, and training apparatus are available in the ratio of one per four men.

(4) Suitable classrooms and training areas are available.

(5) Firing points are available in the ratio of one per four men.

(6) The class firing does not furnish pit details.

(7) No time is lost on account of rain, details, etc.

c. It will be noticed that the course has two natural divisions; the first covering such instruction as necessarily precedes any known-distance range practice, the second being the known-distance range practice itself. The relative amount of time to be given each part of the first division is expressed as a per cent of the whole time allowed for the first division; also in number of hours of an ideal allowance under ideal conditions of 25 hours. The second division, known-distance range practice, course A, should receive at least 30 hours actually on the range.

d. Schedule.—(1)

	Hours	Percent- age
(a) Introduction and outline of course, organization.....	1	4.0
(b) Disassembling and assembling, field and general data.....	4	16.0
(c) Disassembling and assembling of trigger mechanism.....	2	8.0
(d) Miscellaneous lesson.....	1	4.0
(e) Functioning.....	1	4.0
(f) Stoppages and immediate action.....	3	12.0
(g) Care, preservation, and cleaning.....	1	4.0
(h) Points B. D. A.....	1	4.0
(i) Preparatory range practice.....	5	20.0
(j) 1,000-inch range practice.....	6	24.0
Total.....	25	100.0
(k) Known-distance range practice.....	30	

(2) The following schedules show the proportionate amount of time to be allotted the various subjects according to the number of hours available for automatic rifle training:

Total hours available.....	10	15	25	50
(a) Introduction and outline of course, organization.....	1	1	1	1
(b) Disassembling and assembling, field and general data.....	1	1	3	3
(c) Disassembling and assembling of trigger mechanism.....	1	1	1	1
(d) Miscellaneous lesson.....	$\frac{1}{2}$	$\frac{1}{2}$	1	1
(e) Functioning.....	$\frac{1}{2}$	$\frac{1}{2}$	1	1
(f) Stoppages and immediate action.....	1	1	2	2
(g) Care, preservation, and cleaning.....	$\frac{1}{2}$	$\frac{1}{2}$	1	1
(h) Points B. D. A.....	$\frac{1}{2}$	$\frac{1}{2}$	1	1
(i) Preparatory range practice.....	2	3	3	5
(j) 1,000-inch range practice.....	2	6	6	6
(k) Known-distance range practice.....	0	0	5	28
Total.....	10	15	25	50

INDEX

	Paragraph	Page
Accessory and spare-parts case-----	25	18
Antiaircraft fire; range practice-----	70	43
Assault fire; range practice-----	69	42
Assembling:		
Field-----	12-15	5-10
Magazine-----	22	17
Trigger mechanism-----	14	8
Automatic rifle:		
Care and cleaning-----	28	21
Care in the field-----	34	23
Description-----	10	3
Functioning-----	15	10
General data-----	11	4
Mechanical training-----	37	24
Breakages; stoppage-----	17	12
Breech mechanism; cleaning-----	32	22
Burred parts; stoppage-----	17	12
Cartridge extractor; ruptured-----	25	18
Chamber; cleaning-----	30	21
Change lever-----	24	17
Classroom regulations; mechanical training-----	9	2
Cleaning:		
Breech-----	32	22
Chamber-----	30	21
Gas system-----	31	21
Magazine-----	32	22
Ordinary, after firing-----	29	21
Combination tool-----	25	18
Disassembling:		
Field-----	12-15	5-10
Magazine-----	22	17
Trigger mechanism-----	14	8
Equipment:		
Mechanical training-----	8	2
Range practice-----	73	43
Excessive play in parts; stoppage-----	17	12
Extractor, removal without disassembling-----	27	20

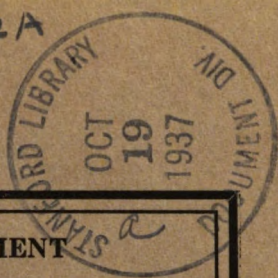
	Paragraph	Page
Failure to fire; cause-----	19	13
Faulty ammunition; stoppage-----	17	12
Field assembling-----	13	6
Field disassembling-----	12	5
Firing pin:		
Broken; cause-----	19	13
Removal without disassembling-----	26	19
Firing, points to be observed before, during, and after--	33	22
Flinching and trigger squeeze-----	53	38
Force not to be used in disassembling or assembling---	9	2
Gas:		
Adjustment-----	36	23
Protection of automatic rifle against-----	35	23
Results of insufficient or excessive-----	36	23
Gas-cylinder cleaning tool-----	25	18
Gas system; cleaning-----	31	21
Instruction, automatic rifle; preparation of schedules----	85	54
Instruction practice:		
Course A-----	76	44
Course B-----	77	45
Course C-----	78	47
Magazine:		
Assembling-----	22	17
Cleaning-----	32	22
Disassembling-----	22	17
Method of operating-----	23	17
Stoppage-----	17	12
Mechanical training:		
Applicable to whom-----	5	2
Classroom regulations-----	9	2
Equipment-----	8	2
Examination questions and answers-----	37	24
Instruction methods of-----	7	2
Lessons-----	84	49
Methods of instruction-----	83	49
Object-----	3	1
Organization-----	6	2
Taken up when-----	4	2
Mechanism wedged, caused-----	19	13
Position stoppage set-ups-----	21	16
Preparatory training:		
Applicable to whom-----	40	28
Equipment-----	43	29
Examination-----	49	36
Method of instruction-----	42	28
Object-----	38	28

Preparatory training—Continued.	Paragraph	Page
Organization of class.....	41	28
Phases.....	44	29
Rapid fire.....	46	31
Score book.....	48	36
Trigger squeeze.....	45	31
When taken up.....	39	28
Wind, effect of.....	47	34
Range personnel, permanent; range practice.....	71	43
Range practice:		
Antiaircraft fire.....	70, 80	43, 47
Applying principles previously learned.....	52	38
Assault fire.....	60, 79	42, 47
Blackening sights.....	56	39
Coaches and coaching.....	58	39
Course, 1,000-inch; known distance.....	75	43
Equipment.....	73	43
Firing; 1,000-inch.....	60-62	39
Firing to align front sight.....	63	40
Flinching and trigger squeeze.....	53	38
Holding rifle during movement of slide.....	54	38
Instruction practice; courses.....	76-78	44-47
Instruction practice; known-distance course.....	67	41
Known distance.....	66	41
Maintaining prescribed rate of fire.....	55	38
Pads.....	57	39
Permanent range personnel.....	71	43
Preliminary training.....	51	38
Purpose.....	50	38
Record practice; known-distance course.....	68	42
Records.....	81	47
Safety precautions.....	74	43
Slow fire; 1,000-inch.....	64	40
Target practice; classification.....	59	39
Timed or rapid fire; 1,000-inch.....	65	40
Uniform.....	72	43
Ruptured cartridges; stoppage.....	17	12
Ruptured case, cause.....	19	13
Safety precautions; range practice.....	74	43
Score book; preparatory range training.....	48	36
Stoppages:		
Breakages.....	17	12
Buried parts.....	17	12
Causes.....	17	12
Classes.....	16	11
Excessive play in parts.....	17	12
Explanation of.....	19	13
Faulty ammunition.....	17	12
Immediate action.....	20	15

Stoppages—Continued.		Paragraph	Page
Position set-ups-----		21	16
Reducing, method of-----		18	12
Ruptured case-----		17	12
Time, piece not disassembled or assembled against-----		9	2
Training:			
Mechanical-----		3-27	1-27
Outline-----		2	1
Trigger mechanism:			
Assembling-----		14	8
Blindfold disassembling and assembling not practiced-----		9	2
Disassembling-----		14	8
Uniform; range practice-----		72	43



W3.63:3 at 1/chap. 2A



WAR DEPARTMENT

BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 2A MARKSMANSHIP—THE AUTOMATIC RIFLE WITH BIPOD AND HINGED BUTT PLATE

BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 2A MARKSMANSHIP—THE AUTOMATIC RIFLE WITH BIPOD AND HINGED BUTT PLATE

**Prepared under direction of the
Chief of Infantry**



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1937**

For sale by the Superintendent of Documents, Washington, D. C. - Price 5 cents

WAR DEPARTMENT,
WASHINGTON, *July 30, 1937.*

Chapter 2A (Marksmanship—the Automatic Rifle with Bipod and Hinged Butt Plate), Part One (Rifle Company), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (9-19-36).]

BY ORDER OF THE SECRETARY OF WAR:

MALIN CRAIG,
Chief of Staff.

OFFICIAL:

E. T. CONLEY,
Major General,
The Adjutant General.

(II)

TABLE OF CONTENTS

SECTION I. General:	Para- graph	Page
Scope	1	1
Fundamentals	2	1
Marksmanship	3	1
II. Preparatory marksmanship training:		
When taken up	4	2
Who will receive preparatory training	5	2
Organization for training	6	2
Method of instruction	7	3
Equipment	8	4
Preparatory training	9	4
Sighting and aiming	10	5
Position exercises	11	5
Prone position	12	5
Sitting position	13	11
Kneeling position	14	11
Assault fire position	15	12
Sight-setting exercises	16	13
Sight-setting and aiming exercises	17	13
Trigger-squeeze exercises	18	14
Rapid-fire exercises	19	14
Exercises in replacing magazines	20	14
Manipulation exercises	21	17
Effects of wind and light	22	18
Scorebook	23	19
Examination	24	19
III. Courses to be fired:		
Range practice	25	20
Marksmanship courses	26	20
IV. Conduct of range practice:		
General	27	24
Officer in charge of range practice	28	24
Range officer	29	25
Company commander	30	25
Safety precautions	31	25
Uniform and equipment	32	26
Use of fire orders	33	26
Personnel at the firing point	34	26
Duties and use of coach	35	26
Blackening sights	36	26
Pads	37	27
Targets to be used	38	27
Firing sequence	39	27
Firing to zero the gun	40	27
Instruction practice, 1,000-inch range	41	29

	Para- graph	Page
SECTION IV. Conduct of range practice—Continued.		
Time fire exercises.....	42	31
Record practice for course H.....	43	32
Known distance firing.....	44	32
Record practice.....	45	32
V. Rules governing record practice:		
1,000-inch range.....	46	33
Known distance range.....	47	33
Examination of equipment.....	48	33
Stoppages.....	49	34
Assistants to the officer in charge of firing.....	50	34
Scoring.....	51	35
VI. Advice to instructors:		
Guide.....	52	36
Time schedule for automatic rifle marksmanship.....	53	37

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 2A

MARKSMANSHIP—THE AUTOMATIC RIFLE WITH BIPOD AND HINGED BUTT PLATE

SECTION I

GENERAL

1. **Scope.**—This chapter prescribes courses of instruction and rules and regulations applicable to the general subject of marksmanship, the Browning automatic rifle equipped with the bipod and hinged butt plate.

2. **Fundamentals.**—To become a good automatic rifleman the soldier must be trained in the following fundamentals:

a. Accurate delivery of every burst if firing automatic fire, and accurate delivery of every shot if firing semiautomatic fire.

b. Mechanical skill in manipulating the gun to obtain proper distribution of fire over targets requiring distribution.

c. Maintenance of fire on the target by accurate and quick re-aiming after every shot of semiautomatic fire and every burst of automatic fire, and by rapid reloading.

3. **Marksmanship.**—*a. Purpose.*—The purpose of the course in marksmanship is to train the automatic rifleman to fire the weapon accurately.

b. Method of training.—(1) Training with the modified automatic rifle is divided into the following phases, in each of which the individual will be required to demonstrate proficiency before he proceeds to the next succeeding phase. During mobilization, or other period of emergency, regimental or

higher commanders are authorized to modify this requirement.

(a) *Mechanical training.*—As prescribed in section II, chapter 2 (Automatic Rifle Marksmanship).

(b) *Preparatory marksmanship training.*—As prescribed in section II of this chapter.

(c) *1,000-inch range practice.*—As prescribed in sections III, IV, and V of this chapter.

(d) *Known distance range practice.*—As prescribed in sections III, IV, and V of this chapter. Omitted if course H only is authorized to be fired.

(2) It is important that all officers and others charged with instruction become familiar with the provisions of this entire chapter before undertaking any part of the instruction of personnel who are to fire.

c. *Who will fire.*—(1) AR 775-10 prescribes the personnel who will fire the modified automatic rifle for record, with the courses to be fired, the qualification scores, and the allowances of ammunition.

(2) All other personnel of infantry rifle companies equipped with the modified automatic rifle will receive mechanical training and preparatory marksmanship training with this weapon and such range practice as available ammunition allowances will permit.

SECTION II

PREPARATORY MARKSMANSHIP TRAINING

4. *When taken up.*—Preparatory training will follow instruction in mechanical training, and precede range practice and record firing.

5. *Who will receive preparatory training.*—All men who are to fire the automatic rifle will receive preparatory training. No distinction will be made between recruits and men who have previously had range practice.

6. *Organization for training.*—The organization for preparatory training is the responsibility of the company commander. Generally, the men of the company should be formed into one group under the company officer most capable of

carrying out the training mission. If desired, men may be combined for training within the battalion.

7. Method of instruction.—*a.* The instructor will explain each step in the preparatory training and then have it demonstrated by specially trained men. He instructs the group leaders in the manner of carrying out training. For instruction in this phase of training, the men undergoing instruction are divided into small groups under the previously trained group leaders. Training progresses in such a manner that all men are proficient in the phase that has been demonstrated before the next phase is taken up.

b. The group leader carries on the training in the area assigned to him. He sees that the training is carried on by the coach and pupil method, and that each member works with every other member to aid in the development of teamwork. He keeps a detailed record of the progress made by each member on the blank form shown below.

RECORD OF AUTOMATIC RIFLE INSTRUCTION

Company Platoon Squad Date

Name	Mechanical course													Marksmanship course													
	General data	Regulations, classroom	Stripping and assembling	Removing firing pin and extractor	Nomenclature	Functioning	Spare parts	Loading magazine	Immediate action	Care and adjustment	Points to be observed	Inspection	Final examination	Sighting and aiming exercises	Position exercises	Sight setting	Sight setting and laying	Trigger squeeze	Rapid-fire exercises	Replacement of magazines	Manipulation exercises	Effects of light and wind	Scorebook	Examination	Instruction practice	Record practice	Qualification as automatic rifleman

Method of marking:		Fair.		Good.
		Very good.		Excellent.
		Perfect.		

c. The instructor checks and coordinates the training of all groups. He will keep a separate record of each man's progress on the prescribed form.

d. Exactness in every detail will be stressed at all times.

8. Equipment.—Each group undergoing training will be equipped as follows:

a. Two Browning automatic rifles with bipods and hinged butt plates.

b. Two sighting bars complete.

c. One 3-inch sighting target.

d. One frame, 3 by 5 inches, for use in making shot groups.

e. One B. A. R. 1,000-inch marksmanship target. See figure 13.

f. One each sandbag or box for rifle rest for making shot groups.

g. Sight blackening materials.

h. Pencils and tissue paper for tracing shot groups.

9. Preparatory training.—Preparatory training is divided into 11 steps. These steps will be taken in sequence as shown below:

a. Sighting and aiming.

b. Positions with a coach and alone.

c. Sight setting.

d. Sight setting and aiming.

e. Trigger squeeze.

f. Rapid-fire exercises.

g. Replacement of magazines by coach and by gunner alone.

h. Manipulation exercises.

(1) Semiautomatic fire exercises.

(2) Automatic fire exercises.

- i. Effects of wind and light.
- j. The scorebook.
- k. Examination.

10. Sighting and aiming.—*a.* The preparatory work in sighting and aiming is similar to that prescribed for the rifle in section VI, chapter 1, Part One, B. F. M., volume III.

b. The rear sight on the automatic rifle is different from that of the rifle. The rear sight on the automatic rifle consists of a large aperture in a disk. No wind gage is provided. Rifles must be zeroed for firing by moving the front sight to the right or left. Soldiers must be instructed in holding off at long ranges in order to compensate for wind effects. These exercises are the basis for all training in marksmanship. The soldier must be thoroughly trained in each step before taking up the next step in training.

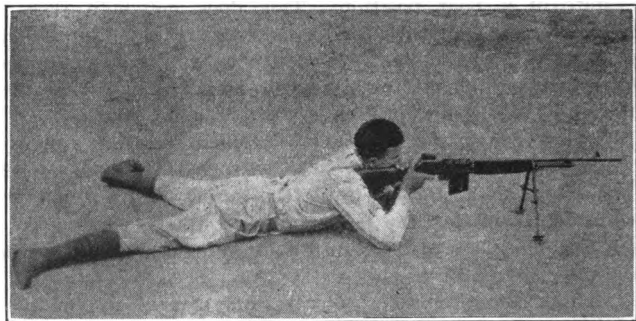
11. Position exercises.—*a.* A soldier well trained in sighting and aiming might make fair scores if armed with the rifle in spite of a poor position. This does not hold true for the soldier armed with the automatic rifle equipped with the bipod. If the soldier's position with this weapon is incorrect it will be difficult for him to fire semiautomatic fire accurately and impossible for him to fire automatic fire accurately. The soldier must be trained to assume, quickly and with accuracy, all positions with this weapon. However, special emphasis should be placed on the prone position not only because it is by far the best and most likely position to be used in combat, but also because it is the most difficult position to assume correctly.

b. All positions must be as carefully learned as the prone position, but the soldier must be taught that the prone position is the normal position, and that he must seek firing positions which will enable him to use the prone position.

c. Due to the side ejection of empty cases from this gun, it is not to be fired from the left-handed position.

12. Prone position.—*a.* The gunner lies down in rear of the weapon, the line of the barrel extending through the center of his right shoulder and right hip bone. His legs are spread well apart. The toes may be dug in for additional bracing, but care should be taken to press evenly with both feet. The

shoulder rest fits snugly on the back part of the shoulder, the butt pressed firmly into the hollow of the shoulder. The shoulders should be on the same level. The right shoulder, especially, should not drop lower than the left shoulder. The elbows are out to the sides and on the same line to form a stable base of support for the rear of the weapon. The left hand grasps the weapon at the small of the stock, fingers uppermost, and the thumb extending well under the stock. The right hand grasps the piece just ahead of the left hand, thumb over the top of the stock, the index finger on the trigger, and the remaining fingers curled with a strong grip under and around the stock. Both hands hold the piece firmly against the shoulder. The left hand, in addition, exerts a downward pressure, holding the hinged butt plate down on the shoulder.



①

FIGURE 1.—Prone position.



②

FIGURE 1.—Prone position. (Note the hands and elbows.)



③

FIGURE 1.—Prone position. (Note shoulder rest and hands.)



(4)

FIGURE 1.—Prone position. (Note that the body is directly behind the gun.)



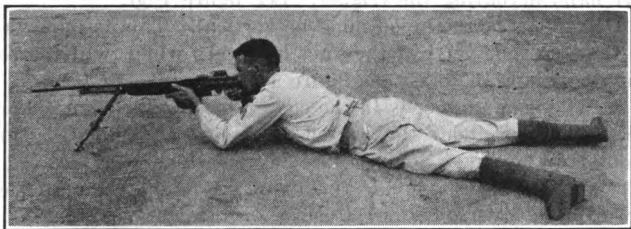
(5)

FIGURE 1.—Prone position. (*Incorrect*—Note that the body is not directly behind the gun.)



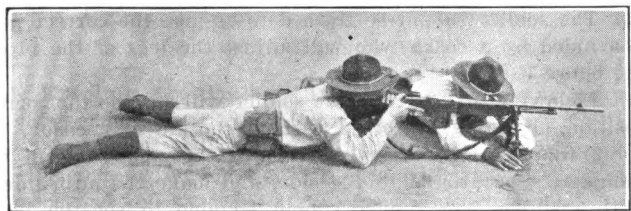
(6)

FIGURE 1.—Prone position. (The right hand may support the piece and the left hand actuate the trigger.)



(7)

FIGURE 1.—Prone position. (*Incorrect*—Note that the bipod legs are not vertical; that the hands are incorrect.)



(8)

FIGURE 1.—Prone position. (The coach adjusting the bipod legs.)



⑨

FIGURE 1.—Prone position. (The gunner adjusts the bipod legs alone.)

b. Some men, including left-handed men, may find that they are able to obtain more stability with the positions of the hands reversed, the right hand supporting the weapon, and the left hand actuating the trigger. See figure 1 ⑥.

c. The legs of the bipod must be vertical. This is important. If they are not vertical they act as levers which will increase the dispersion of fire. See figure 1 ⑦.

d. When the gunner is in the correct position, the gun should be pointed at about the center of the target. Small adjustments to the exact point of the target which it is desired to hit can be made by moving the shoulders to the right and left, or up and down. If the lateral movement is so great as to make it necessary to move the elbows, the entire body must be shifted. Large vertical corrections should be made by moving the elbows closer together or farther apart. Under no circumstances will increased elevation or depression be obtained by moving the bipod legs from the vertical. Elevation adjustments may also be made by adjusting the bipod legs.

e. The soldier should be trained to assume the correct position aided by a coach who will adjust the legs of the bipod. See figure 1 ⑧.

f. Following this exercise the soldier will assume the correct position, adjusting the bipod without the aid of a coach. In doing this it is necessary to remove the weapon from the shoulder, slide around to the side, and make the adjustment. With training, the gunner should be able to set the bipod correctly the first time. See figure 1 ⑨.

g. The sling is not used in this position.

13. Sitting position.—*a.* The firer sits half-faced to the right; feet well apart and well braced on the heels, which are dug slightly into the ground; body leaning well forward; both upper arms resting along the inside of the legs and well braced; cheek pressed firmly against the stock and placed as far forward as possible without straining; left hand near the center of the forearm, the piece resting on the palm of the hand.

b. The bipod is in its locked position.

c. The loop sling or hasty sling may be used in this position.

d. The sitting position is used when firing from ground that slopes downward to the front. In practicing this position the feet may be slightly lower than the ground upon which the pupil sits.

e. The hinged butt plate need not be used in this position.

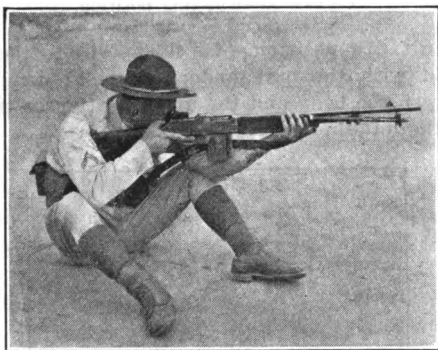


FIGURE 2.—Sitting position.

14. Kneeling position.—*a.* The firer kneels half-faced to the right on the right knee, sitting on the right heel, the left knee bent so the left lower leg is vertical; left arm well under the rifle and resting on the left knee with the point of the elbow beyond the kneecap; right elbow approximately at the height of the shoulder; cheek pressed firmly against the stock and placed as far forward as possible without strain. Sitting on the side of the foot instead of the heel is authorized.

- b. The loop sling or hasty sling may be used in this position.
- c. The hinged butt plate need not be used.



FIGURE 3.—Kneeling position.

15. **Assault fire position.**—In this position, the automatic rifle is held with the butt under the right armpit, clasped firmly between the body and the upper portion of the arm, the sling over the left shoulder.

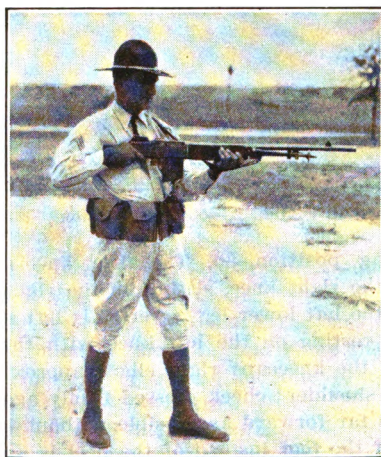


FIGURE 4.—Assault fire position.

16. Sight-setting exercises.—*a.* The purpose of the sight-setting exercises is to teach accurate and rapid sight setting.

b. The instructor explains that the movable slide on the rear sight is set at the desired range graduation so that the gun will have proper elevation when it is aimed. He explains that there is no wind gage on the rear sight, but that the front sight may be moved to the right or left to zero the rifle, and that wind must be compensated for by holding the rifle off to the side from which the wind is coming. The instructor then has a soldier take his place at a gun in the prone position and demonstrate the exercise as follows:

(1) The instructor announces the range; for example: range 800.

(2) The gunner raises the sight leaf, sets the sight with the correct setting, and assumes the correct firing position.

(3) The instructor checks the sight setting.

c. Each group then performs the exercise explained above under the supervision of the group instructor until all are proficient in accurate and rapid sight setting.

17. Sight-setting and aiming exercises.—*a.* The purpose of the sight-setting and aiming exercise is to develop accuracy and speed in setting the sights and aiming the gun at an aiming point.

b. The B. A. R. target shown in figure 13 is set up 1,000 inches from the gun; the gunner is in the prone position.

c. The instructor demonstrates the exercise as follows:

(1) The instructor announces the range and designates the target by giving a fire order similar to the following: **Range 200, paster no. 5.** After giving the first element of the command, the instructor pauses a sufficient length of time to permit the gunner to repeat it. The gunner then raises the sight leaf and sets the sight. While he is setting the sight the instructor announces the target. The gunner repeats this second element of the command, and upon completing the sight setting, moves his body and the gun until the sights are accurately alined upon the designated aiming point. He then calls **UP.**

(2) The instructor then checks the sight setting and aiming, pointing out the errors, if any.

d. The men then go through the exercise under the supervision of the group instructors until they become proficient in setting the sight and aiming the gun on a designated aiming point within a time limit of 10 seconds. Each exercise will start with the sight leaf down and the slide set at 500 yards.

e. It must be understood by the soldier that in aiming at his target the center of the bottom of the aiming paster or the aiming line is used as the aiming point.

18. Trigger-squeeze exercises.—*a.* The proper method of squeezing the trigger in semiautomatic fire is similar to that prescribed for the rifle. With the automatic rifle it is necessary to continue the squeeze after the shot is fired in order that two shots will not be fired automatically.

b. Trigger-squeeze exercises should be carried out in the preparatory exercises regardless of the fact that the men undergoing instruction have just completed firing with the rifle. The forward movement of the bolt when the trigger is pulled is confusing to many men and causes them to allow the alinement of the sights to become incorrect. The piece must be held steady and in perfect alinement during this forward movement if accurate results are to be obtained.

19. Rapid-fire exercises.—*a.* Rapid-fire exercises enable the soldier to gain dexterity in the manipulation of the automatic rifle. Efficient manipulation is an important factor in automatic rifle firing.

b. Rapid-fire exercises are held at 1,000 inches with B. A. R. targets. The exercises include observance of the principles of sighting, position, and trigger squeeze, as taught in the preceding exercises.

c. During semiautomatic firing it is essential that the firer count his shots so that he will know when the last one has been fired and the magazine is empty. This prevents sending the bolt home on an empty chamber, which would necessitate pulling back the operating handle and so waste time. During preparatory range practice, the bolt is left in the forward position, and the change lever set at "F." Firing is simulated by pressing the trigger until it clicks for each shot.

20. Exercises in replacing magazines.—*a.* Exercises should be conducted in which the soldier replaces his own magazines. In these exercises, the following points should be stressed:

(1) Magazines are placed in the magazine belt so that, when grasped and carried forward by the right hand, the long portion will be to the rear.

(2) Each soldier should count his shots.

(3) Magazines are dropped out after the twentieth shot.

(4) All magazines to be used should fall out by their own weight on release of the magazine catch.

(5) The new magazine is drawn from the belt and placed in the receiver with one rapid, smooth movement.

(6) Empty magazines are replaced in the belt.



FIGURE 5.—Releasing the empty magazine.



FIGURE 6.—Placing the new magazine in the gun.



FIGURE 7.—Placing the empty magazine in the belt.



FIGURE 8.—To get magazines from the pockets in front and well in back, it is necessary to remove the gun from the shoulder.

b. Following this, exercises should be conducted in which the gunner counts the shots and after the twentieth shot releases the empty magazine. The coach should be ready to insert a fresh magazine and allow the gunner to fire as rapidly as possible.

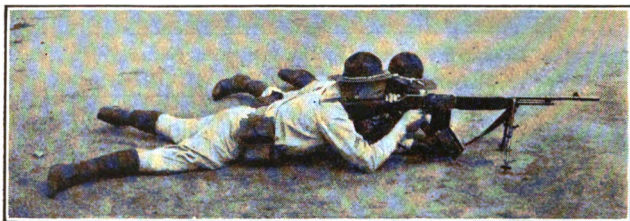


FIGURE 9.—The coach puts in a fresh magazine as soon as the empty one drops.

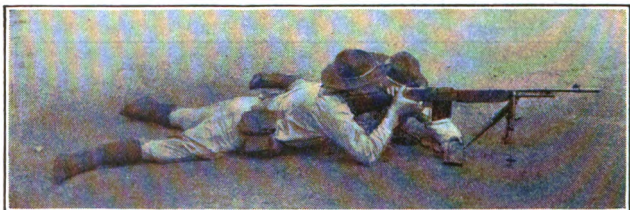


FIGURE 10.—The coach removes the empty magazine from under the gun.

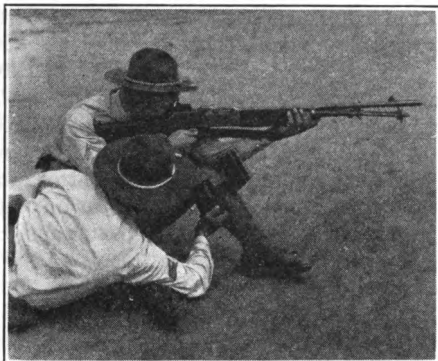


FIGURE 11.—The coach replaces the magazine with the gunner in the sitting position.



FIGURE 12.—The coach replaces the magazine with the gunner in the kneeling position.

21. Manipulation exercises.—*a.* The purpose of the manipulation exercises is to train the soldier in proper fire distribution.

b. The manipulation exercises are divided into two classes; semiautomatic fire exercises and automatic fire exercises.

c. Semiautomatic fire exercises are conducted as follows:

(1) The instructor announces the range, as *Range, 300*; designates the target, as *Paster no. 5*; shows the extent of the target by *Traverse right, 20 rounds*.

(2) The gunner sets his sights at the announced range, aims at paster no. 5, and simulates firing 20 rounds across to the right, firing one round, moving the point of aim 2 inches to the right and firing another shot, and so on until he has fired his 20 rounds. He should end on paster no. 6. He will check his aim each time on the aiming line.

d. Exercises in automatic fire may be given in a similar manner except that bursts of fire will be simulated.

22. Effects of wind and light.—*a. General principles.*—The information contained in section X, chapter 1, Part One, B. F. M., volume III, with reference to the effect of wind, light, elevation rule, canting the rifle, sight-setting and sight-changing exercises, as modified below, is applicable to firing with the automatic rifle.

b. Effect of wind.—Wind from either side blows the bullet out of its path. This movement must be allowed for by aiming off toward the side from which the wind is blowing. The amount the bullet will be blown from its path depends on wind velocity and range. During known distance range practice the amount to aim off after the first shot is fired semiautomatically is readily determined from the position of the spotter on the target.

c. Wind rule.—The approximate windage correction for the first shot can be determined by applying the wind rule formula described below:

The square of the range R (expressed in hundreds of yards), multiplied by the velocity of the wind V , and divided by 10, equals the number of inches to aim off for a 3 or 9 o'clock wind. For winds from 1, 5, 7, 11 o'clock take one-half of the correction.

Stated as a formula the rule is—

$$\frac{R^2 \times V}{10} \quad \text{or} \quad \frac{R \times R \times V}{10}$$

Example:

Range----- 500 yards.
 Velocity of wind (estimated)----- 8 miles per hour.
 Direction of wind----- 3 o'clock.

Required: Number of inches to aim off.

Solution:

$$\frac{R \times R \times V}{10} \text{ equals } \frac{5 \times 5 \times 8}{10}$$

equals 20 inches to aim off.

23. Scorebook.—*a.* The use by the soldier of a scorebook to keep a personal record of the results and conditions of his firing throughout the period of range practice is as necessary with the automatic rifle as with the service rifle. The same scorebook as prescribed for the rifle (ch. 1) is used for the automatic rifle.

b. The use of the scorebook for the automatic rifle is in general as prescribed for the service rifle in paragraph 46, section X, chapter 1, Part One, B. F. M., volume III. Certain variations are noted as follows:

(1) The aiming point used for each shot is plotted in the column headed "W. G." Upon completion of the score no entry is made after the words "zero windage." In place of zero windage the aiming point for the rifle at that range is determined and its location indicated by an "X" on the recording target.

(2) In the table of wind allowances in the scorebook, the column headed "Inches" indicates the distance to aim off with the first shot for any direction and velocity of wind.

c. Exercises in plotting data in scorebook as prescribed in paragraph 47, section X, chapter 1, Part One, B. F. M., volume III, may be given at the discretion of the instructor.

d. The scorebook need not be kept for the 1,000-inch firing.

24. Examination.—Preparatory marksmanship training is concluded with an examination of all undergoing instruction in all phases of preparatory work. The examination should consist of questions designed to bring out the essential points of the subjects covered, and also practical demonstrations of all the work covered.

SECTION III

COURSES TO BE FIRED

25. Range practice.—*a.* Range practice is divided into two phases:

- (1) 1,000-inch range practice.
- (2) Known distance range practice.

b. Practice on the 1,000-inch range is included in all marksmanship courses to conserve time, ammunition, and troop labor during range practice season. The 1,000-inch range provides a convenient, short distance range whereon the soldier can receive training with service ammunition in the fundamentals of marksmanship. The targets for this range are designed to provide the classes of fixed, traversing, and searching fire required in field firing. In practice on this range the soldier's errors are readily detected and pointed out to him.

c. Firing on the known distance range will complete the marksmanship training of the soldier. On the long ranges the soldier learns how to compensate for the effects of light and wind. Errors of this nature cannot be shown on the 1,000-inch range, nor can there be any practice in these important points. If the firing on the 1,000-inch range has been done under careful supervision and the fundamentals thoroughly learned, the prescribed allowances should prove sufficient to train the soldier.

26. Marksmanship courses.—Four courses are outlined below. The particular course to be fired will be designated by higher authority.

a. Course E.

TABLE I.—1,000-inch range to zero the gun

(For details see par. 40.)

Range	Time	Shots	Target	Position	Type of fire
<i>Inches</i> 1,000	No	5	B. A. R. paster no. 1	Prone w/bipod	S. A. point.
		5	B. A. R. paster no. 2	Kneeling (hasty sling).	Do.
		5	B. A. R. paster no. 5	Prone w/bipod	A. point.
		5	B. A. R. paster no. 6	-----do-----	Do.

TABLE II.—*Instruction practice*

(For details see par. 41.)

Range	Time	Shots	Target	Position	Type of fire
<i>Inches</i> 1,000	No	20	B. A. R. paster no. 3 to paster no. 4.	Prone w/bipod..	S. A. Traverse and search, 2 mags., 10 rds. ea.
		20	B. A. R. paster no. 5 and paster no. 6.	-----do-----	A. 4 mags., 5 rds. ea.
		20	B. A. R. paster no. 7 to paster no. 8.	-----do-----	A. traverse and search, 5-rd. bursts.

TABLE III

(For details see par. 42.)

Range	Time	Shots	Target	Position	Type of fire
<i>Inches</i> 1,000	<i>Sec- onds</i>				
	15	5	B. A. R. paster no. 1	Prone w/bipod..	S. A. point.
	20	5	B. A. R. paster no. 2	Kneeling (hasty sling).	Do.
	60	20	B. A. R. paster no. 3 to paster no. 4.	Prone w/bipod..	S. A. traverse and search, 2 mags., 10 rds. ea.
	5	5	B. A. R. paster no. 5	-----do-----	A. point.
	25	15	B. A. R. paster no. 6	-----do-----	A. point, 3 mags., 5 rds. ea.
	25	20	B. A. R. paster no. 7 to paster no. 8.	-----do-----	A. traverse and search, 5-rd. bursts.

TABLE IV

(For details see par. 42b.)

Range	Time	Shots	Target	Position	Type of fire
<i>Inches</i> 1,000	<i>Sec- onds</i>				
	10	5	B. A. R. paster no. 1	Prone w/bipod..	S. A. point.
	15	5	B. A. R. paster no. 2	Kneeling (hasty sling).	Do.
	50	20	B. A. R. paster no. 3 to paster no. 4.	Prone w/bipod..	S. A. traverse and search, 2 mags., 10 rds. ea.
	3	5	B. A. R. paster no. 5	-----do-----	A. point.
	20	15	B. A. R. paster no. 6	-----do-----	A. point, 3 mags., 5 rds. ea.
	20	20	B. A. R. paster no. 7 to paster no. 8.	-----do-----	A. traverse and search, 5-rd. bursts.

TABLE V.—*Known distance range to zero the gun*
(For details see par. 40.)

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>					
200----	No	5	Rifle D.....	Prone w/bipod..	S. A. point.
200----	No	5	Rifle D (modified)..	do.....	A. point.
300----	No	5	Rifle D.....	do.....	S. A. point.
300----	No	5	Rifle D (modified)..	do.....	A. point.

TABLE VI.—*Instruction practice, known distance range*

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>					
200----	No	5	Rifle D.....	Kneeling (hasty sling).	S. A.
200----	No	5	Rifle D (modified)..	Prone w/bipod..	A.
300----	No	5	Rifle D.....	do.....	S. A.
300----	No	5	Rifle D (modified)..	do.....	A.
500----	No	5	Rifle D.....	do.....	S. A.
500----	No	5	Rifle D (modified)..	do.....	A.

TABLE VII

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>	<i>Secs.</i>				
200----	25	10	Rifle D.....	Kneeling (hasty sling).	S. A., 2 mags., 5 rds. ea.
200----	25	15	Rifle D (modified)..	Prone w/bipod..	A., 3 mags., 5 rds. ea.
300----	30	10	Rifle D.....	do.....	S. A., 2 mags., 5 rds. ea.
	30	15	Rifle D (modified)..	do.....	A., 3 mags., 5 rds. ea.
500----	35	10	Rifle D.....	do.....	S. A., 2 mags., 5 rds. ea.
	10	5	Rifle D (modified)..	do.....	A. (May be fired in 2 bursts.)

TABLE VIII.—*Record practice, known distance range*

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>	<i>Secs.</i>				
200----	25	10	Rifle D.....	Kneeling.....	S. A., 2 mags., 5 rds. ea.
	25	15	Rifle D (modified)..	Prone w/bipod..	A., 3 mags., 5 rds. ea.
300----	30	10	Rifle D.....	do.....	S. A., 2 mags., 5 rds. ea.
	30	15	Rifle D (modified)..	do.....	A., 3 mags., 5 rds. ea.
500----	35	10	Rifle D.....	do.....	S. A., 2 mags., 5 rds. ea.
	10	5	Rifle D (modified)..	do.....	A. (May be fired in 2 bursts.)

b. Course F.—(1) *1,000-inch firing.*—Fire tables I, II, III, and IV of course E.

(2) *Known distance firing.*—Fire table V of course E.

TABLE IX.—*Instruction practice, known distance range*

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>					
200....	No	5	Rifle D.....	Kneeling (hasty sling).	S. A.
200....	No	5	Rifle D (modified)...	Prone w/bipod...	A.
300....	No	5	Rifle D.....	do.....	S. A.
300....	No	5	Rifle D (modified)...	do.....	A.

TABLE X

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>	<i>Sec- onds</i>				
200....	25	10	Rifle D.....	Kneeling (hasty sling).	S. A., 2 mags., 5 rds. ea.
200....	25	15	Rifle D (modified)...	Prone w/bipod...	A., 3 mags., 5 rds. ea.
300....	30	10	Rifle D.....	do.....	S. A., 2 mags., 5 rds. ea.
300....	30	15	do.....	do.....	A., 3 mags., 5 rds. ea.

TABLE XI.—*Record practice, known distance range*

Fire table X once.

c. Course G.—(1) *1,000-inch firing.*—Fire tables I, II, III, and IV of course E.

(2) *Known distance firing.*—Fire table V of course E.

TABLE XII.—*Instruction practice, known distance range*

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>					
200....	No	5	Rifle D.....	Kneeling (hasty sling).	S. A.
200....	No	5	Rifle D (modified)...	Prone w/bipod...	A.

TABLE XIII

Range	Time	Shots	Target	Position	Type of fire
<i>Yards</i>	<i>Sec- onds</i>				
200----	25	10	Rifle D-----	Prone w/bipod--	S. A., 1 mag.
200----	25	10	----do-----	Kneeling (hasty sling).	Do.
200----	55	20	----do-----	Prone w/bipod--	S. A., 4 mags., 5 rds. ea.
200----	25	10	----do-----	Kneeling-----	S. A., 2 mags., 5 rds. ea.
200----	5	5	Rifle D (modified)--	Prone w/bipod--	A., 1 mag.
200----	25	15	----do-----	----do-----	A., 3 mags., 5 rds. ea.

TABLE XIV.—*Record practice, known distance range*

Fire table XIII once.

d. Course H.—(1) *1,000-inch firing.*

(a) *Instruction practice.*—Fire tables I, II, III, and IV of course E.

(b) *Record practice.*—Fire table IV once.

(2) *Known distance range firing.*—None.

SECTION IV

CONDUCT OF RANGE PRACTICE

27. General.—*a.* Any 1,000-inch range is satisfactory for the 1,000-inch firing.

b. The targets used will be B. A. R. targets (fig. 13) for 1,000-inch firing. For the known distance firing, rifle target D for semiautomatic firing and rifle target D, modified (fig. 14), for automatic firing will be used.

c. All firing points should have firm soil. Loose loam or sand on the firing point has an adverse effect on accuracy.

28. Officer in charge of range practice.—*a.* The officer in charge of range practice is detailed by the regimental or unit commander for the purpose of coordinating the firing and arranging and supervising the details with reference to the assignment of firing points. He is responsible for the rigid application of safety precautions by all units firing. He will

make timely requests to the range officer for repairs, supplies, and alteration of installations.

b. During record practice he will be assisted by officers detailed by the regimental or unit commander for duties on the firing line and in the pits.

c. During record practice he will render decisions upon interpretation of the rules governing record practice which may be referred to him.

29. Range officer.—Successful operation of a range requires the appointment of a range officer well in advance of range practice. The chief duties of the range officer are as follows:

a. To make timely estimates for material and labor in order to place the range in proper condition for firing.

b. To supervise and direct repairs to installations.

c. To regulate the distribution of ranges and targets.

d. To maintain a storeroom where the materials required may be secured.

e. When safety demands, to instruct and supervise range guards.

30. Company commander.—The company commander conducts the firing of his unit and is responsible for the efficiency of its training.

31. Safety precautions.—*a.* Firing will not begin on any range until the officer in charge of range practice has ascertained that the range is clear and has authorized the commencement of firing.

b. Firing will be done only under the direct supervision of an officer.

c. No gun will be loaded until a command to do so has been given.

d. No gun will be dismounted after firing until an officer has inspected it to see that it is unloaded.

e. No person will be allowed in front of the guns for any purpose until directed by an officer who has ordered that all guns be cleared and has ascertained that the order has been completely carried out.

f. No gun will be removed from the firing line until the magazine has been withdrawn and the bolt is in the forward position.

g. Danger flags will be displayed at prominent positions on the range during all firing.

h. Care will be taken to avoid the undue exposure of ammunition to the direct rays of the sun.

32. Uniform and equipment.—The uniform and equipment to be worn during range practice will be prescribed by the regimental or unit commander.

33. Use of fire orders.—All firing will be initiated by definite fire orders. The gunners will be required to repeat all fire orders. An example of a typical fire order is as follows: **20 rounds, LOAD. Range 1,000 inches; paster no. 3 to paster no. 4 semiautomatic. COMMENCE FIRING.**

34. Personnel at the firing point.—During instruction practice a coach will be at each gun. The noncommissioned officer in charge of the gun, if he is not the coach, may be at the gun when his presence is needed.

35. Duties and use of coach.—A coach will be at each gun during instruction practice. The success of the instruction will depend to a great extent on the thoroughness and exactness with which the coach performs his duties. The duties of the coach are as follows:

a. To require the gunner to inspect the gun.

b. To check the sight setting and aiming, requiring them to be correct.

c. To require the gunner to have his sights set at 500 yards and to have the sight leaf down at the start of each exercise on the 1,000-inch range.

d. To observe the gunner's position, holding, and manipulation during firing; if necessary, he may stop the firing to correct errors.

e. To observe the gunner and see that he re-aims after each shot or burst.

f. To require the gunner to fire as required for each target.

g. To point out errors and explain their effect upon the exercises.

h. To keep constant watch on the adjustment and condition of the gun.

36. Blackening sights.—The front sight of the automatic rifle will be blackened for all range firing.

37. Pads.—The use of elbow pads is recommended. Shoulder pads are unnecessary, but may be used if desired.

38. Targets to be used.—*a.* For firing on the 1,000-inch range the B. A. R. 1,000-inch marksmanship target will be used. No deviations in dimensions are authorized. If targets are not available they can be made by cutting a stencil of beaverboard or similar material. (See fig. 13.)

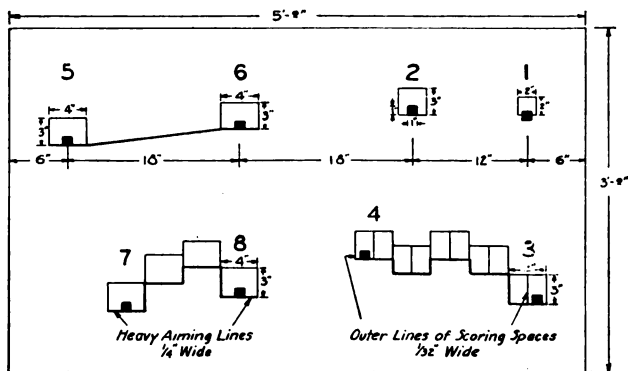


FIGURE 13.—Target, B. A. R. 1,000-inch range.

b. For firing on the known distance range the standard rifle target D will be used for all semiautomatic fire. For all automatic fire on this range the rifle target D will be used, modified as shown in figure 14.

39. Firing sequence.—All of the courses are designed to save time in mobilization or in other training programs. For this reason, and in view of the fact that a large amount of firing can be accomplished without undue fatigue to personnel, no restrictions are placed upon the sequence of firing which may be accomplished in any one day. If time permits, it is desirable that record practice be not fired on the same date instruction practice is fired.

40. Firing to zero the gun.—*a.* The ammunition for zeroing the gun is laid down in tables I and V. There is an allowance for zeroing at 1,000 inches and an allowance for the known distance range. This is an individual allowance, but com-

pany commanders are authorized to pool any extra rounds not needed by the more expert shots.

b. The targets furnished for the 1,000-inch range are so designed that the center of impact of any shot group should be in the center of the scoring space just above the point of

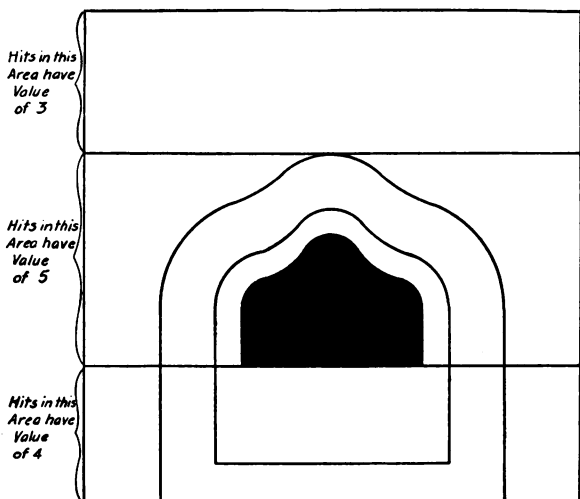


FIGURE 14.—Browning automatic rifle rapid-fire target. (Modified D target—200, 300, 500 yards.)

aim. The targets furnished for the known distance range are so designed that the center of impact of any shot group should be in the center of the scoring space above the point of aim.

c. To zero the automatic rifle on the 1,000-inch target a correct and steady aim must be taken on the designated paster with the rear sight set at an elevation of 300 yards for the first shot. Corrections in elevation to place the shots in the center of the scoring space may be applied to the rear sight under the direction of the coach after each shot. Corrections in deflection to bring the center of the shot group to the center

of the scoring space, made by tapping or adjusting the front sight, will be applied only after *two* or more shots have been fired, and will be accomplished as directed by an officer.

d. For the zeroing on the known distance range, 10 rounds at 200 yards and 10 rounds at 300 yards are allowed. The targets should be pulled after each shot semiautomatic fire and a spotter placed in the target to facilitate the correction of errors in the sights. Likewise spotters should be placed in all bullet holes of the two bursts fired automatically. No ammunition is allotted for the determination of the zero at 500 yards, but there is sufficient firing under table VI to permit any minor adjustments which may be necessary.

e. When the same automatic rifle is being used by a group, the highest qualified man in the group, with the service rifle, will zero the weapon as far as the movement of the front sight is concerned. Each member of the group should use his zeroing ammunition to determine his zero elevation, and the exact point of aim necessary for him to place his shots in the center of the scoring space.

f. The front sight of the rifle must not be moved after it has once been zeroed, except by the authority of an officer.

41. Instruction practice, 1,000-inch range.—*a.* Table II—Instruction practice should be fired on the same target and immediately following the zeroing of the automatic rifle. For this the soldier is allowed 60 rounds of ammunition. This provides for 1 semiautomatic and 5 automatic exercises. Each exercise should start with a fire order requiring the gunner to set his sights, aim at a designated paster, and fire the exercise. The fire order should be given clearly just one time.

b. The first exercise should be semiautomatic fire. For this exercise, the gunner is in the prone position with the bipod properly adjusted for firing. The sight should be set at 500 yards and down. The exercise will start with a fire order similar to the following: **10 rounds, LOAD. Range 1,000 inches zero, semiautomatic, paster no. 3, traverse left 20 rounds to paster no. 4. COMMENCE FIRING.** At the command **Load** the gunner should insert a magazine containing exactly 10 rounds in the receiver. At the command **Range 1,000 inches zero** the gunner should raise the sight leaf and set his rear

sight at the proper zero for his rifle. The gunner will not aim at paster no. 3 until the command **Commence firing**. At the command **Commence firing** the gunner aims at paster no. 3, fires 2 shots, moves 2 inches to the left along the aiming line and fires 2 shots, he continues traversing and searching to the left across the target, firing two shots into each scoring space until 10 shots have been fired, he releases the empty magazine, inserts a fresh magazine loaded with 10 rounds and continues across the target, ending at paster no. 4. There is no time limit for this exercise.

c. The next exercises should be the four 5-round burst automatic fire exercises. For these the gunner is in the prone position with the bipod adjusted for firing. The sight should be set at 500 yards and down. Each exercise will start with a fire order similar to the following: **Five rounds, LOAD. Range 1,000 inches zero, automatic, paster no. 5. COMMENCE FIRING**. At the command **Load** the gunner inserts a magazine with 5 rounds in the receiver. At the command **Range 1,000 inches zero**, the gunner raises the sight leaf and sets his rear sight at the correct zero for his rifle. The gunner will not lay on the paster until the command **Commence firing**. At the command **Commence firing** the gunner will aim at paster no. 5 and fire 5 rounds automatic fire. He then fires three 5-round bursts at paster no. 6.

d. After completing these 4 exercises, the 20-round automatic exercise should be fired. For this exercise the gunner is in the prone position with the bipod adjusted for firing. The sight should be set at 500 yards and down. The exercise will start with a fire order similar to the following: **20 rounds, LOAD. Range 1,000 inches zero, automatic, paster no. 7, traverse right 20 rounds to paster no. 8. COMMENCE FIRING**. At the command **Load** the gunner inserts a magazine with 20 rounds in the receiver. At the command **Range 1,000 inches zero**, the gunner raises the sight leaf and sets his rear sight at the correct zero for his rifle. The gunner will not lay on paster no. 7 until the command **Commence firing**. At the command **Commence firing** the gunner will aim at paster no. 7 and fire 5 rounds automatic fire. He will then traverse to the right, firing 5 rounds automatic fire on each of the scoring

spaces, ending at paster no. 8. The center of the heavy aiming lines will be used for aiming points for the two center scoring spaces. There is no time limit for this exercise.

e. Zeroing, and the above listed exercises, should be completed on the same target by each order before it leaves the firing point. Targets should then be changed for the next order. After all orders have completed the firing of table II, the time fire exercises in table III should be fired, each order firing all exercises before leaving the firing point.

42. Time fire exercises.—*a.* Table III consists of 6 time fire exercises on the B. A. R. 1,000-inch target. Each gunner should fire the exercises in rotation until all have been completed. Gunners may be allowed to examine their targets between exercises, at which time coaches can point out errors and corrective measures. The exercises may be fired in any desired order. The following order of rotation and fire orders have been found satisfactory for training purposes. All exercises will start with a suitable fire order. For all exercises, at the command **Load**, the gunner will insert a magazine with the designated number of rounds in the receiver. At the command **Range 1,000 inches zero**, the gunner will raise the sight leaf and set his correct zero on the rear sight. The gunner will not lay on the designated aiming paster until the command **Commence firing** is given. Time will be taken from the word "Firing". Extra magazines, with the correct number of rounds to complete the exercise will be *loaded from the belt*. Exercises will start with sight set at 500 yards.

(1) *First exercise.*—The gunner is in the prone position with the bipod adjusted for firing. Fire order: **5 rounds, LOAD. Range 1,000 inches zero, semiautomatic, time fire, paster no. 1. COMMENCE FIRING.**

(2) *Second exercise.*—The gunner is in the prone position with the bipod adjusted for firing. Fire order: **10 rounds, LOAD. Range 1,000 inches zero, semiautomatic, time fire, paster no. 3, traverse left 20 rounds. COMMENCE FIRING.**

(3) *Third exercise.*—The gunner is in the prone position with the bipod adjusted for firing. Fire order: **5 rounds, LOAD. Range 1,000 inches zero, automatic, time fire, paster no. 5. COMMENCE FIRING.**

(4) *Fourth exercise.*—The gunner is in the prone position with the bipod adjusted for firing. Fire order: **5 rounds, LOAD. Range 1,000 inches zero, automatic, time fire, paster no. 6, 15 rounds. COMMENCE FIRING.**

(5) *Fifth exercise.*—The gunner is in the prone position with the bipod adjusted for firing. Fire order: **20 rounds, LOAD. Range 1,000 inches zero, automatic, time fire, paster no. 7, traverse right 20 rounds. COMMENCE FIRING.**

(6) *Sixth exercise.*—The gunner is in the standing position with the hasty sling. Fire order: **5 rounds, LOAD. Range 1,000 inches zero, semiautomatic, time fire, paster no. 2. COMMENCE FIRING.** At the command *Commence firing*, the gunner assumes the kneeling position and fires 5 shots at paster no. 2 in 15 seconds.

NOTE.—This exercise is placed last to save time in adjusting the sling.

b. After all orders have completed the time fire exercises listed above, those listed in table IV should be fired as indicated for table III.

43. Record practice for course H.—Record practice for course H consists in firing table IV once. However, no coach is allowed at the gun during record practice. Exercises may be fired in any desired rotation. Each exercise will be started with a suitable fire order. Gunners will complete all exercises before the targets are examined. Extra magazines, necessary to complete individual exercises, will be in the belt at the start of each exercise.

44. Known distance firing.—In firing on the known distance range, at the discretion of the officer in charge of firing, all firing, except record practice, prescribed for 200, 300, and 500 yards in the several tables may be fired without changing ranges. The table prescribed for record practice will be completed as a whole, but, at the discretion of the officer in charge of firing, may commence at 200, 300, or 500 yards.

45. Record practice.—Following instruction practice, record practice will be fired.

SECTION V

RULES GOVERNING RECORD PRACTICE

46. 1,000-inch range.—Rules governing record practice on the 1,000-inch range are as follows:

a. The gunner takes his place on the firing line alone with the prescribed amount of ammunition loaded in magazines in such a manner that each one will fire the prescribed amount for a definite exercise. During the exercise he must execute each fire order, setting the sights, aiming the gun, and firing the prescribed amount of ammunition without any aid or coaching.

b. The B. A. R. 1,000-inch marksmanship target will be used for record firing.

c. Each soldier will fire every exercise on the target. The target will not be scored until every exercise has been completed.

d. The officer in charge of record firing will make certain that no gunner has his sights set at the correct zero before the fire order is begun. The fire order will be given clearly just once. The gunner may set his sights but will not aim the gun until *Commence firing* is given, when the time for the exercise will start.

e. The exercises will be fired in rotation as quickly as magazines can be changed from the preceding exercise.

47. Known distance range.—Rules governing record practice on the known distance range are as follows:

a. The gunner will fire without the aid of a coach.

b. Rifle rapid-fire target D will be used for all S. A. firing. Rifle target D modified as shown in figure 14 will be used for all automatic fire.

c. The times fire exercises will be conducted as laid down in section XV, chapter 1, Part One, B. F. M., volume III, for the rifle for rapid-fire exercises.

48. Examination of equipment.—Each gunner will be held responsible that the gun and magazines he brings to the firing line are in good working order. Time will not be allowed for the examination of equipment at the firing point, except in

cases where it is necessary for more than one man to fire the same gun in following orders, when a reasonable time will be allowed for examination.

49. Stoppages.—*a.* When a stoppage occurs which cannot be cleared by operating the operating handle, the gunner will call **Time**. The officer in charge of firing will note the time left to complete the exercise. The stoppage will be reduced. The gunner will load and aim and commence firing on command from the officer in charge, who will allow him the remaining time.

b. Single rounds, in automatic fire exercises, should be placed in the next magazine except when they are the last round remaining to be fired to complete the exercise.

c. If the stoppage is manifestly the fault of the gunner in failing to inspect either the gun, the magazines, or ammunition, or due to incorrect loading, or replacing of magazines, no time will be allowed to complete the firing and only that part of the exercise which was completed will be scored.

d. The gunner will be allowed to fire rounds ejected in clearing stoppages.

e. Should a breakage occur, the gun will be repaired or a different gun substituted and the exercise completed.

f. The officer in charge or his assistants will render all decisions on stoppages.

50. Assistants to the officer in charge of firing.—Sufficient assistants will be detailed from companies other than the ones firing, to assist the officer in charge. These assistants should be detailed so that there is at least one officer for every two guns firing. These officers will assist the officer in charge in every way possible and will specifically see that—

a. Each 1,000-inch target conforms to specifications.

b. Note deductions for firing before the command **Commence firing** and after **Cease firing**.

c. Count the number of bullet holes in the 1,000-inch target and report any that have more than the prescribed number.

d. Note the time out for clearing stoppages and inspect to determine whether the stoppage was due to any fault of the soldier.

e. Score the target in accordance with paragraph 51.

51. Scoring.—*a.* The 1,000-inch record target will be scored as follows:

(1) A total of 5 points will be credited for each scoring space which is hit one or more times. Thus 5 points each may be credited for scoring spaces 1, 2, 5, and 6. Five points may be credited for each of the 10 scoring spaces hit between 3 and 4, inclusive, giving a possible total of 50 for this series. Five points may be credited for each of the 4 scoring spaces hit between 7 and 8, inclusive, giving a possible total of 20 for this series. The total possible points for hitting all scoring spaces on the target is 90.

(2) One point will be counted for each hit in the scoring space, except that not more than 5 hits will be counted in scoring spaces 1, 2, 5, and 7 to 8, inclusive, nor more than 15 in scoring space 6; nor more than 2 in each half of the scoring spaces from 3 to 4, inclusive. Hits touching the line between scoring spaces will be counted so as to give the soldier the highest score. Hits on outer lines count as hits. The total possible is 70 points.

(3) For firing before *Commence firing* or after *Cease firing* has been given, 5 points will be deducted for each round fired.

(4) The total score for the entire target will be computed in accordance with (1), (2), and (3) above.

b. The known distance record targets will be scored as follows:

(1) For the rifle D target used for semiautomatic fire, 5's 4's, 3's, 2's, and misses will be counted.

(2) For the modified rifle D target used for automatic fire, hits within or on the added lines will count 5; those below the lower line will count 4; those above the upper added line will count 3.

(3) The same penalties apply as for 1,000-inch firing.

c. In case of hits on the wrong target on either the known distance or 1,000-inch range, the firer whose target received the erroneous additional hits will refire his score. The firer who placed hits upon another's target will count only those upon his own and will not be permitted to refire the exercise.

d. The individual classification to be attained and the minimum score required for qualification in each course are given in AR 775-10.

SECTION VI

ADVICE TO INSTRUCTORS

52. Guide.—*a.* This section provides several suggestions for instructors. Its provisions are not mandatory.

b. Success in training in marksmanship with the modified automatic rifle will largely depend upon the instructor's own knowledge and planning of his work and upon the confidence in the capabilities of the weapon which he is able to instill in his men. Before range practice starts it is desirable to demonstrate the accurate semiautomatic and automatic fire which can be delivered by a firer who has been correctly trained in the use of the modified weapon.

53. Time schedule for automatic rifle marksmanship.—The following tables may be found useful in preparing a schedule of automatic rifle marksmanship. These tables are not mandatory and at best can only be used as a guide. Various units will be in different stages of training and will be able to devote different amounts of time to this phase of training.

a. Preparatory training.

Subject	Where taught	How taught	Time allotted
Fundamentals.....	Parade ground..	Lecture.....	15 minutes.
Sighting and aiming.....	do.....	Demonstration and practical work.	30 minutes.
Positions.....	do.....	do.....	1 hour.
Sight setting.....	do.....	do.....	30 minutes.
Sight setting and aiming.....	do.....	do.....	40 minutes.
Trigger squeeze.....	do.....	do.....	15 minutes.
Rapid-fire exercises.....	do.....	do.....	1 hour.
Repiacing magazines.....	do.....	do.....	30 minutes.
Manipulation exercises.....	do.....	do.....	1 hour.

(1) This schedule is based on the premise that these men have completed firing the service rifle. There may be as many as 4 men to each gun, though 3 are better. The effects

of wind, light, the scorebook, and the examination are taken up with the men when they are not at the guns.

(2) The times shown above are allotted to each individual undergoing training. With 4 men per gun, 22 hours and 40 minutes are necessary for this training, including the time for lectures and demonstrations.

b. Range practice.

The times allotted here are not per individual but per organization firing.

Subject	Where taught	How taught	Time allotted
			<i>Hours</i>
To zero.....	1,000-inch range.....	Practical work..	2
Instruction practice.....	do.....	do.....	9
Record practice.....	do.....	do.....	3
Zero and instruction practice..	Known distance range..	do.....	8
Record practice.....	do.....	do.....	4



W 3.63:3 pt 1/chap. 3

WAR DEPARTMENT

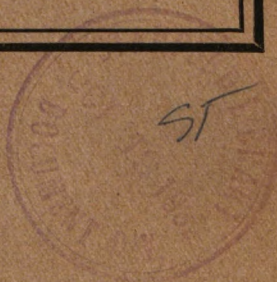
BASIC FIELD MANUAL



**Volume III
BASIC WEAPONS**

**PART ONE
RIFLE COMPANY**

**CHAPTER 3
AUTOMATIC PISTOL MARKSMANSHIP**



BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 3 AUTOMATIC PISTOL MARKSMANSHIP

**PREPARED UNDER DIRECTION OF THE
CHIEF OF INFANTRY**



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932**

For sale by the Superintendent of Documents, Washington, D. C. — Price 10 cents

WAR DEPARTMENT,
WASHINGTON, *April 5, 1932.*

Chapter 3 (Automatic Pistol Marksmanship), Part One (Rifle Company), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (4-13-31).]

BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,

*General,
Chief of Staff.*

OFFICIAL:

C. H. BRIDGES,

Major General,

The Adjutant General.

II

FOREWORD

Basic Field Manual, Volume III, Basic Weapons, will be published in six parts as follows:

PART ONE. Rifle company. (Each chapter of Part One will be published as a separate pamphlet.)

- Chapter 1. Rifle marksmanship.
2. Automatic rifle marksmanship.
 3. Automatic pistol marksmanship.
 4. Instruction with the bayonet.
 5. Instruction with hand and rifle grenades.
 6. Musketry.

PART TWO. Fire-control instruments.

- Chapter 1. Machine-gun instruments.
2. 37-mm. gun and 3-inch trench-mortar instruments.
 3. Care, repair, and adjustment of instruments.

PART THREE. Machine-gun company.

- Chapter 1. Mechanical training with the machine gun.
2. Machine-gun marksmanship.
 3. Technique of machine-gun fire.
 4. Barrages and concentrations.

PART FOUR. Howitzer company.

- Chapter 1. Mechanical training with the 37-mm. gun and the 3-inch trench mortar.
2. 37-mm. gun and the 3-inch trench-mortar marksmanship.
 3. Technique of the 37-mm. gun and the 3-inch trench-mortar fire.

PART FIVE. Combat practice firing.

- Chapter 1. General.
2. Rifle company.
 3. Machine-gun company.
 4. Howitzer company.

PART SIX. Antiaircraft marksmanship—Infantry weapons.

- Chapter 1. General.
2. Rifle and automatic rifle.
 3. Machine gun, caliber 30.

TABLE OF CONTENTS

SECTION		Paragraph	Page
	I. General -----	1-3	1-4
	II. Marksmanship, dismounted -----	4-16	5-34
	III. Marksmanship, mounted -----	17-19	34-48
	IV. Manual of the pistol -----	20-22	48-51

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 3

AUTOMATIC PISTOL MARKSMANSHIP

(The matter contained herein supersedes TR 150-20, June 15, 1927 (including C1, January 3, 1928; C2, January 2, 1929; and C3, January 2, 1930), and 150-25, January 28, 1924 (including C1, February 15, 1926; C2, January 2, 1929; and C3, January 2, 1930).)

SECTION I

GENERAL

1. **Scope.**—Instruction in pistol marksmanship is divided into two distinct courses, dismounted and mounted. The dismounted course applies to all units armed with the pistol, the mounted course to Cavalry only.

2. **Care and cleaning of automatic pistol.**—*a.* Careful, conscientious work is required to keep the automatic pistol in a condition that will insure perfect functioning of the mechanism and continued accuracy of the barrel. It is essential that the entire mechanism is kept cleaned and oiled to avoid jams.

b. The magazines also require care to prevent rust or an accumulation of sand or dirt in the interior. They are easily disassembled for cleaning and oiling.

c. To clean the pistol after firing, remove the slide from the receiver and the barrel from the slide; this is usually all the disassembling required but, after prolonged firing, the extrac-

tor and firing pin should also be removed. When the pistol has been exposed to sand or water, it is necessary to disassemble it completely for thorough cleaning and oiling. The details of disassembling the pistol may be found in paragraph 3.

d. The care and cleaning of the bore and the removal of primer and metal fouling are described fully in chapter 1.

3. Disassembling and assembling the automatic pistol.—a. To disassemble (fig. 1).—(1) Remove the magazine by pressing the magazine catch (48).

(2) Press the plug (16) inward and turn the barrel bushing (13) to the right until the plug (16) and the end of the recoil

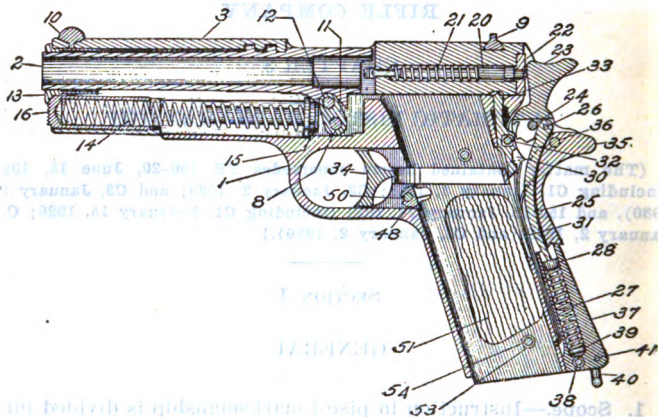


FIGURE 1.—Longitudinal section of pistol, showing component parts in assembled position

spring (14) protrude from their seat, releasing the tension of the spring (14). As the plug (16) is allowed to protrude from its seat, the finger or thumb should be kept over it so that it will not jump away and be lost or strike the operator. Draw the slide (3) rearward until the smaller rear recess in its lower left edge stands above the projection on the thumb piece of the slide stop (8); press gently against the end of the pin of the slide stop (8) which protrudes from the right side of the receiver (1) above the trigger guard and remove the slide stop (8).

(3) This releases the link (11), allowing the barrel (2), with the link (11) and the slide (3), to be drawn forward together

from the receiver (1), carrying with them the barrel bushing (13), recoil spring (14), plug (16), and recoil-spring guide (15).

(4) Remove these parts from the slide (3) by withdrawing the recoil-spring guide (15) from the rear of the recoil spring (14), and drawing the plug (16) and the recoil spring (14) forward from the slide (3). Turn plug (16) to right to remove from recoil spring (14). Turn the barrel bushing (13) to the left until it may be drawn forward from the slide (3). This releases the barrel (2), which, with the link (11), may be drawn forward from the slide (3), and by pushing out the link pin (12) the link (11) is released from the barrel (2).

(5) Press the rear end of the firing pin (20) forward until it clears the firing-pin stop (22), which is then drawn downward from its seat in the slide (3); the firing pin (20), firing-pin spring (21), and extractor (17) are then removed from the rear of the slide (3).

(6) The safety lock (36) is readily withdrawn from the receiver (1) by cocking the hammer (23) and pushing from the right on the pin part or pulling outward on the thumb piece of the safety lock (36) when it is midway between its upper and lower positions. The cocked hammer (23) is then lowered and removed after removing the hammer pin (24) from the left side of the receiver (1). The housing pin (38) is then pushed out from the right side of the receiver (1), which allows the mainspring housing (37) to be withdrawn downward and the grip safety (35) rearward from the handle. The sear spring (31) may then be removed. By pushing out the sear pin (32) from the right to the left side of the receiver (1), the sear (30) and the disconnecter (33) are released.

(7) To remove the mainspring (27), mainspring cap (28), and housing-pin retainer (39) from the mainspring housing (37), compress the mainspring (27) and push out the small mainspring-cap pin (29).

(8) To remove the magazine catch (48) from the receiver (1), its checkered left end must be pressed inward, when the right end of the magazine catch (48) will project so far from the right side of the receiver (1) that it may be rotated one half turn. This movement will release the magazine-catch lock (50) from its seat in the receiver (1), when the magazine catch (48), the magazine-catch lock (50), and the magazine-catch spring (49) may be removed.

(9) With the improved design of magazine-catch lock (50) the operation of dismounting the magazine catch (48) is simplified in that when the magazine catch (48) has been pressed inward the magazine-catch lock (50) is turned by means of a screw driver or the short leaf of the sear spring (31) a quarter turn to the left when the magazine catch (48) with its contents can be removed. The improved design will be recognized from the fact that the head of the magazine-catch lock (50) is slotted.

(10) The trigger (34) can then be removed rearward from the receiver (1).

(11) The hammer strut (25) or the long arm of the screw driver can be used to push out all the pins except the mainspring-cap pin (29) lanyard-loop pin (41), and ejector pin (19).

b. To assemble.—(1) Proceed in the reverse order.

(2) It should be noted that the disconnecter (33) and sear (30) are assembled as follows: Place the cylindrical part of the disconnecter (33) in its hole in the receiver (1) with the flat face of the lower part of the disconnecter (33) resting against the yoke of the trigger (34). Then place the sear (30), lugs downward, so that it straddles the disconnecter (33). The sear pin (32) is then inserted in place, so that it passes through both the disconnecter (33) and the sear (30).

(3) The sear (30), disconnecter (33), and hammer (23) being in place and the hammer (23) down, to replace the sear spring (31), locate its lower end in the cut in the receiver (1), with the end of the long leaf resting on the sear (30); then insert the mainspring housing (37) until its lower end projects below the frame about one-eighth inch, replace the grip safety (35), cock the hammer (23), and replace the safety lock (36); then lower the cocked hammer (23), push the mainspring housing (37) home and insert the housing pin (38).

(4) In assembling the safety lock (36) to the receiver (1) use the tip of the magazine follower (47) or the screw driver to press the safety-lock plunger (7) home, thus allowing the seating of the safety lock (36). It should be remembered that when assembling the safety lock (36) the hammer (23) must be cocked.

(5) When replacing the slide (3) and barrel (2) on the receiver (1), care must be taken that the link (11) is tilted forward as far as possible and that the link pin (12) is in place.

SECTION II

MARKSMANSHIP, DISMOUNTED

4. Safety precautions.—*a. Rules for safety.*—Before ball ammunition is issued, the soldier must know the essential rules for safety with the pistol. The following rules will be taught as soon as the recruit is sufficiently familiar with the pistol to understand them. They should be enforced by constant repetition and coaching until their observance becomes the soldier's fixed habit when handling the pistol. When units carrying the pistol are first formed, the officer or noncommissioned officer in charge will cause the men to execute *inspection pistol*.

(1) Execute *unload* every time the pistol is picked up for any purpose. Never trust your memory. Consider every pistol as loaded until you have proved it otherwise.

(2) Always unload the pistol if it is to be left where someone else may handle it.

(3) Always point the pistol up when snapping it after examination. Keep the hammer fully down when the pistol is not loaded.

(4) Never place the finger within the trigger guard until you intend to fire or to snap for practice.

(5) *Never point the pistol at anyone you do not intend to shoot, nor in a direction where an accidental discharge may do harm.* On the range, do not snap for practice while standing back of the firing line.

(6) Before loading the pistol, draw back the slide and look through the bore to see that it is free from obstruction.

(7) On the range, do not insert a loaded magazine until the time for firing.

(8) Never turn around at the firing point while you hold a loaded pistol in your hand, because by so doing you may point it at the man firing alongside of you.

(9) On the range, do not load the pistol with a cartridge in the chamber until immediate use is anticipated. If there is any delay, lock the pistol and only unlock it while extending the arm to fire. Do not lower the hammer on a loaded cartridge; the pistol is much safer cocked and locked.

(10) In reducing a jam *first remove the magazine.*

(11) To remove a cartridge not fired *first remove the magazine* and then extract the cartridge from the chamber by drawing back the slide.

(12) In campaign, when early use of the pistol is not foreseen, it should be carried with a fully loaded magazine in the socket, chamber empty, hammer down. When early use of the pistol is probable, it should be carried loaded and locked in the holster or hand. Extra magazines should, in campaign, be carried fully loaded.

(13) When the pistol is carried in the holster loaded, cocked, and locked the butt should be rotated away from the body when drawing the pistol in order to avoid displacing the safety lock.

(14) Safety devices should be frequently tested. A safety device is a danger device if it does not work when expected.

b. Tests.—(1) *Safety lock.*—Cock the hammer, and then press the safety lock upward into the safe position. Grasp the stock so that the grip safety is depressed and squeeze the trigger three or four times. If the hammer falls, the safety lock is not safe and must be repaired.

(2) *Grip safety.*—Cock the hammer and, being careful not to depress the grip safety, point pistol downward and squeeze the trigger three or four times. If the hammer falls, or the grip safety is depressed by its own weight, the grip safety is not safe and must be repaired.

(3) *Half-cock notch.*—Draw back the hammer until the sear engages the half-cock notch and squeeze the trigger. If the hammer falls, the hammer or sear must be replaced or repaired. Draw the hammer back nearly to full cock and then let it slip. It should fall only to half cock.

(4) *Disconnecter.*—Cock the hammer. Shove the slide one-quarter inch to the rear; hold slide in that position and squeeze the trigger. Let the slide go forward, maintaining the pressure on the trigger. If the hammer falls, the disconnecter is worn on top and must be replaced. Pull the slide all the way to the rear and engage the slide stop. Squeeze the trigger and at the same time release the slide. The hammer should not fall. Release the pressure on the trigger and then squeeze it. The hammer should then fall. The disconnecter prevents the release of the hammer unless the slide and barrel are in the forward position safely interlocked. It also prevents more than one shot following each squeeze of the trigger.

5. *Instruction and practice.*—*a. Relative value.*—(1) Pistol firing is a purely mechanical operation that any man who is physically and mentally fit to be a soldier can learn to do well if properly instructed. The methods of instruction must be

the same as are used in teaching any mechanical operation. The soldier must be taught the various steps in their proper order and must be carefully watched and corrected whenever he makes a mistake.

(2) Good shooting is more the result of careful instruction than of mere practice. Unless properly instructed, men instinctively do the wrong thing in firing the pistol. They instinctively jerk the trigger, which is the cause of flinching. Hence, mere practice fixes the instinctive bad habits.

(3) If, however, a man has been first thoroughly instructed in the mechanism of correct shooting and is then carefully and properly coached when he begins firing, correct shooting habits rapidly become fixed.

(4) The ultimate object of the training is to develop the ability to fire one or more accurate shots quickly, but training must begin with carefully coached slow fire to attain accuracy and be followed by practice that will gradually shorten the time without sacrificing the accuracy.

b. Methods of instruction.—(1) Pistol instruction is divided into two phases; preparatory instruction and range firing. In the preparatory instruction the soldier learns practically all the principles of good shooting. In range firing he cultivates the will power to apply these principles when using ball ammunition until proper, fixed habits have been acquired.

(2) The principles of good shooting are simple and easy to learn except the trigger squeeze, which is difficult to apply to a loaded pistol. To this important item most of the instructor's time will be devoted during the period of range practice.

(3) There are six distinct steps in the preparatory instruction:

- (a) Aiming exercises.
- (b) Position exercises.
- (c) Trigger-squeeze exercises.
- (d) Rapid-fire exercises.
- (e) Quick-fire exercises.
- (f) Examination on preparatory work.

(4) The steps are progressive and must always be taught in proper sequence.

(5) Each of the first five steps begins with a talk by the instructor and a demonstration by a squad which the instructor puts through the exercises that are to constitute the day's work. He shows how the corporal organizes the work in the

squad so that no men are idle and how pairs coach each other when they are not under instruction by an officer or a non-commissioned officer. He shows exactly how to execute each of the exercises about to be taken up and explains its purpose and application in pistol shooting.

(6) The instructor who gives these very essential talks and demonstrations may be the organization commander, or he may be a specially qualified officer who has been detailed as battalion or regimental instructor. But the actual application of the demonstrated exercises to the men of the command must be by the officers and noncommissioned officers of the organization undergoing instruction.

(7) Instruction must be thorough and must be individual. General instruction of groups of men is not enough. The instructors must see that each man understands each and every point and can explain it in his own words.

(8) In peace-time training and in war, when time is available for a complete course of instruction and practice, the blank form shown in paragraph 6 c (explained in the first talk) must be kept by each squad leader and by each platoon leader independently. This blank form shows at a glance just how much each man knows about each feature of training and permits concentration of instruction where most needed.

(9) Interest and enthusiasm must be sustained and everything possible should be done to stimulate them. If the exercises are carried out in a manner approximately correct and as a routine piece of work, results will be very disappointing.

(10) It is of utmost importance that the trigger squeeze be explained in such a manner as to give the soldier a clear understanding of how it should be executed.

(11) All authorities on shooting agree that the trigger must be squeezed with a steady increase of pressure. If a man knows when his pistol will go off it is because he suddenly gives the trigger all the pressure necessary. Conversely, if the increase of pressure is steady the man can not know when the pistol will be discharged. Hence, he is instructed to *squeeze the trigger in such a way as not to know just when the hammer will fall*. This does not mean that the process is necessarily a slow one and that it will take a comparatively long time to fire a shot. A man, through training, can reduce the time used in pressing the trigger to as brief a period as one second and still press it in such a manner that he does not know just what

part of the second the discharge will take place. When the soldier has acquired the ability to squeeze the trigger properly, even though it be very slowly, he soon learns to shorten the time without changing the process.

(12) Whenever a man is in a firing position, whether it be at preparatory instruction or during practice firing, he must have a coach beside him to watch him and point out his errors.

(13) None of the preparatory exercises are executed by command or in unison by a group of men. Instruction is at all times individual. The men are placed in pairs and alternate in coaching each other. This method gives each man the necessary physical rest without halting the progress of his instruction. He is learning while watching another man and attempting to correct his mistakes.

(14) A great deal of preparatory practice is necessary in order to strengthen the muscles of the hand and arm and to fix the habit of correct trigger squeeze. The periods of exercise should not ordinarily be of long duration. Three or four 10-minute periods per day for a month will produce good results on the range. These periods of instruction can often be held during waits when troops are on maneuvers or field exercises. Some kind of a mark can always be found that will serve as an aiming point.

(15) It is a good plan to have full-sized pistol targets placed in the vicinity of the barracks to encourage the men to spend part of their time in preparatory practice.

(16) The preparatory exercises should be held out of doors, using full-sized pistol targets, but during inclement weather they can be held indoors, using miniature targets, with good results.

c. *Scope of preparatory instruction.*—(1) Each man's pistol will be closely examined for defects before the beginning of the preparatory instruction.

(2) Every man who is to fire on the range should be put through the preparatory course. Part of the preparatory instruction may have escaped the men the previous year and part of it has certainly been forgotten; in any case it will be beneficial to go over it anew and refresh the mind on the subject.

(3) In peace time noncommissioned officers should be put through a rigid test before the period of preparatory instruction for the organization begins. This is also desirable in war time when time is available.

6. First step; aiming.—*a. Apparatus required.*—The apparatus required for a set of equipment is listed below. When an entire squad is engaged in this work there should be two sets of this equipment in order that a number of the men do not remain idle. The work of the squad can then be carried on as in rifle marksmanship.

One sighting bar.

One pistol rest.

Two small aiming disks.

One 5-inch aiming disk.

Two small boxes, with paper tacked on one side.

One piece of paper at least 2 feet square and tacked on a wall or frame.

NOTE.—Men who have once been instructed in the aiming exercises, either in preparation for rifle or for pistol firing, will require very little instruction in aiming during subsequent seasons. They will, however, go through the aiming exercises at least once to verify their knowledge of this subject and to assign them a mark in the proper column on the blank form shown in *c* below.

(1) *The sighting bar.*—(a) The sighting bar is described in chapter 1. References there to the peep sight should be disregarded.

(b) Carefully blacken all pieces of tin or cardboard and the top of the bar. Nail the bar to a box about one foot high and place the box on the ground, table, or other suitable place.

(c) The sighting bar is used in instruction for two reasons; the sights are larger than on the pistol and errors in aiming can be more easily seen and pointed out to the beginner, and the eyepiece of the sighting bar forces the man under instruction to place his eye so that he sees the sights in proper alignment and thus he learns how to align the sights of the pistol properly. Without an eyepiece the instructor can not know whether or not the recruit has his eye in proper position.

(2) *The pistol rest.*—(a) To construct a sighting rest for the pistol (fig. 2) take a piece of wood about 10 inches long, $1\frac{1}{4}$ inches wide, and nine-sixteenths inch thick. Shape one end so that it will fit snugly in the handle of the pistol when the magazine has been removed. Screw or nail this stick to the top of a post or other object at such an angle that the pistol when placed on the stick will have its barrel approximately horizontal. A suitable sighting rest for the pistol may also be

easily improvised by cutting an additional notch to hold the pistol in one end of the box used as a rifle rest.

(b) Having first learned the principles of aiming by means of the sighting bar, the soldier is taught to apply them to the pistol on its rest.

(3) *Aiming disks.*—(a) For each sighting bar and each pistol rest a small disk (three inches in diameter) is made of white cardboard or of tin with white paper pasted on it and with a small bull's-eye in the center. In the exact center of the bull's-eye is a small hole just large enough to admit the point of a pencil. For indoor or close-range work the bull's-eye should not be larger than a 50-cent piece.

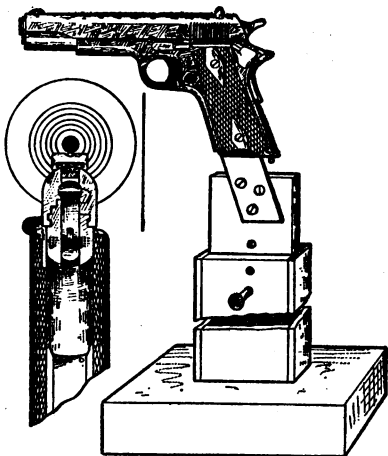


FIGURE 2.—The pistol rest

(b) There should be one 5-inch aiming disk for each squad for shot-group exercise at 25 yards. The large disk should be of tin, painted black, with a handle four or five feet long and of the same color as the paper on which the shot groups are to be made.

b. Sighting exercises.

(1) *First exercise.*—(a) The squad leader or instructor shows a sighting bar to his squad or group and points out the front and rear sights, the eyepiece, and the removable target. He explains the use of the sighting bar as follows:

1. The front and rear sights on the sighting bar represent enlarged pistol sights.
2. The sighting bar is used in the first sighting exercise because with it small errors can be easily seen and explained to the pupil.
3. The eyepiece requires the pupil to place his eye in such position that he sees the sights in exactly the same alignment as seen by the coach.

4. There is no eyepiece on the pistol, but the pupil learns by use of the sighting bar how to align the sights properly when using the pistol.
5. The removable target attached to the end of the sighting bar is a simple method of readily aligning the sights on a bull's-eye.

(b) The instructor explains the open sight to the assembled group, showing each man the illustration of a correct sight alignment. (Fig. 3.)

(c) The instructor, using the open sight, adjusts the sights of the sighting bar, with target removed, to illustrate a correct alignment of the sights. He has each man of the assembled group look through the eyepiece at each of the sight adjustments.



FIGURE 3.—Normal open sight

(d) The instructor adjusts the sights of the sighting bar with various small errors in sight alignment and has each man of the assembled group endeavor to detect the errors.

(e) The instructor describes a correct aim, again showing the illustration to each man. (Fig. 3.) He explains that the top of the front sight is seen through the middle of the open sight and is raised to a height so that its top is level with the outside edges of the open sight and just touches the bottom of the bull's-eye, so that all of the bull's-eye can be clearly seen.

(f) The instructor explains that the eye should be focused on the bull's-eye in aiming, and he assures himself, by questioning the pupils, that each man understands what is meant by focusing the eye on the bull's-eye.

(g) The instructor adjusts the sights of the sighting bar and the removable target so as to illustrate a correct aim and has each man of the group look through the eyepiece to observe this correct aim.

(h) The instructor adjusts the sights and the removable target of the sighting bar so as to illustrate various small errors and has each man in the group attempt to detect the error.

(i) The exercise described above having been completed by the squad leader or other instructor, the men are placed in pairs and the exercise is repeated by the coach and pupil method.

(2) *Second exercise.*—(a) With the pistol on the pistol rest and the sights pointing at a blank sheet of paper on a board or on the wall, stand with the head in the same relative position as in firing the pistol and look through the sights. (Fig. 4.) Then by signal or by word have the disk moved until the bottom edge of the bull's-eye is in exact alignment with the sights. Then command **Hold** and move away from the pistol and let the man undergoing instruction look through the sights to see what is the proper aim.

(b) Have the man under instruction look through the sights while he directs the disk to be moved until the sights are aligned on the bottom of the bull's-eye. The instructor then looks through the sights to see if any error has been made.

(c) Have the sights adjusted on the bull's-eye with various very slight errors and see if the man under instruction can detect them readily.

(3) *Third exercise.*—Using the sighting rest for the pistol, require the man under instruction to direct the marker to move the disk until the sights are aimed at the bottom edge of the bull's-eye and to command **Hold**. The instructor then looks at the aim, and after noticing whether the aim is right or wrong commands: **MARK**. The marker, without moving the disk, makes a pencil mark on the paper through the hole in the center of the bull's-eye. Repeat the operation until three marks have been made. The instructor looks at the aim each time, but he says nothing to the man until all three marks have been made and joined together so as to make a shot group. The faults, if any, are then pointed out. The size and shape of the shot group will be discussed and the exercise will be repeated several times. At 30 feet, using the small bull's-eye, the shot group should be small enough to be covered by a dime.

c. *Blank form.*—This form is used during the period of preparatory instruction. Its object is to show at all times the state of instruction of each man and to insure his thorough instruction in all necessary points before range practice begins.

Names	Recruit instruction				Pistol marksmanship—dismounted											Re- marks
	Functioning and operation	Safety precautions	Test of safety devices	Care and cleaning	Sighting bar	Exercises with the pistol rest	Holding the breath	Position of the hand	Position exercise	Trigger squeeze exercise	Instruction in calling the shot	Rapid-fire exercise	Quick-fire exercise	Ability as a coach	Final examination	

Method of marking:



Fair.



Good.



Very good.



Excellent.



Excellent. Has instructional ability.

7. Second step; position.—a. Essentials of proper position.—To assume the proper position for firing it is necessary to know how to aim, how to grasp the pistol, how to hold the breath properly, and the correct position of the body with relation to the target.

(1) *How to grasp the pistol.*—(a) To take the grip, hold the pistol in the left hand and force the grip safety device down and back into the crotch formed between the thumb and forefinger of the right hand. The thumb is carried parallel with or slightly higher than the forefinger; it should never be lower. Close the three lower fingers on the stock firmly but not with a tense grip.

(b) The thumb and forefinger squeeze the frame of the pistol but the ball of the thumb does not always touch the pistol, depending on the conformation of the man's hand. By this pressure, movement to the right or left is controlled, and the trigger squeeze can be better applied and coordinated.

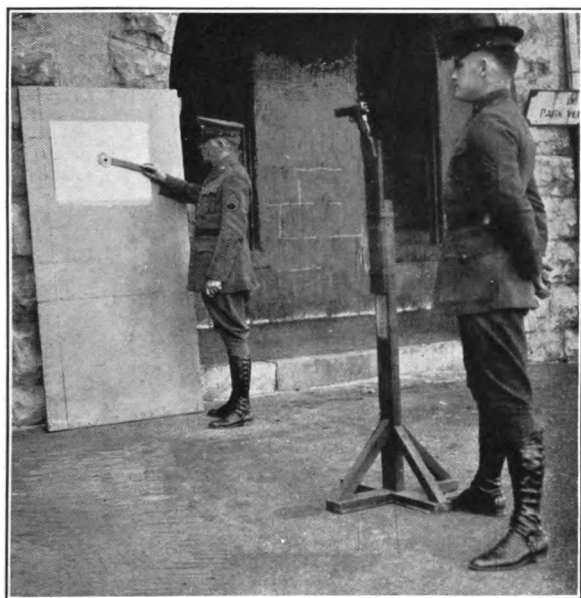


FIGURE 4.—Sighting exercise



FIGURE 5.—How to grasp the pistol

(c) The muscles of the arm are firm without being rigid. There should be no bending of the arm at the elbow when the pistol is fired. On the other hand, the arm should not be locked at the elbow. When the firer is shooting properly, after recoil, the pistol arm should automatically carry the pistol back to the position shown in Figure 6.

(2) *How to hold the breath.*—(a) The proper method of holding the breath is important because many men, without instruction, hold the breath in the wrong way or do not hold it at all.

(b) To hold the breath, draw into the lungs a little more air than an ordinary breath, let a little of the air out and stop the rest by closing the throat. Do not hold the breath with the throat open or by the muscular effort of the diaphragm.

(3) *Position of the body.*—(a) The position of the body is a little more than half faced to the left, the feet 12 or 18 inches apart, depending on the man, the head erect, and the body perfectly balanced when the pistol is held in the shooting position.

(b) The whole position should be natural and comfortable. Upon assuming the position there is some point to which the pistol points naturally and without effort. If this point is not the center of the target the whole body must be shifted so as to bring the target into proper alignment. Otherwise the firer will be firing under a strain because he will be pulling the pistol on the target by muscular effort for each shot. Any unnecessary tensing of any of the muscles of the hand, arm, or body will cause tremors and should therefore be avoided.

b. Position exercise.—(1) Required for this exercise: A line of L targets with firing points at 15 and 25 yards, or a line of small aiming bull's-eyes placed at the height of the shoulder.

(2) The men, armed with the pistol, are placed in one line at one pace interval. The command: 1. *Inspection*, 2. *PISTOL*, is given to verify the fact that all pistols are unloaded.

(3) Demonstrate the position of the hand in gripping the stock and describe the grip in detail.

(4) Require each man to grip the stock of his pistol in the prescribed manner, using the free hand to grasp the barrel and set the stock well back in the pistol hand between the thumb and the first finger.

(5) Describe the correct method of holding the breath while aiming and require each man to practice it a few times.

(6) Demonstrate the correct position of the whole body when firing, explaining in detail the position of the feet, legs, body muscles, arms, and head.

(7) Require each man to assume the correct firing position. The officers and noncommissioned officers of the organization correct individuals who are at fault.

(8) The above exercises having been completed, instruction becomes individual, under a coach. The men are placed in pairs opposite L targets or opposite small aiming bull's-eyes and take turns coaching each other.

(9) The details of the position exercises are—

(a) Grasp the stock with the correct grip.

(b) Face target, then face half left.

(c) Separate the feet 12 to 18 inches.

(d) Align the sights on the bottom edge of the bull's-eye, arm extended.

(e) Hold the breath.

(f) As soon as the arm becomes tired or the aim becomes unsteady, assume the position of *raise pistol*.

(g) The pistol should be removed from the right hand and the muscles of the hand, arm, and shoulder relaxed and exercised before resuming the grip. This should also be done between shots in slow fire.

(10) After the firer has completed the position exercise he may repeat it with a weight, such as a pair of field glasses in a case suspended from the right arm. The weight is suspended, first between shoulder and elbow, then from the forearm, then from the wrist, and finally from the barrel of the pistol, interspersed with short rests. The value of this exercise lies in developing the muscles of the shoulder and arm.

(11) (a) The hammer is not raised during the position exercises and the trigger is grasped very lightly with the finger.

(b) After a short rest repeat the exercise.

(c) The man acting as coach watches carefully and corrects all errors.

(d) The man under instruction and the coach change places as the officer in charge of the instruction desires. This should be every three to five minutes.

(e) Only a few hours in all should be devoted to the position exercises, as all of its details are included in the trigger-squeeze exercise.

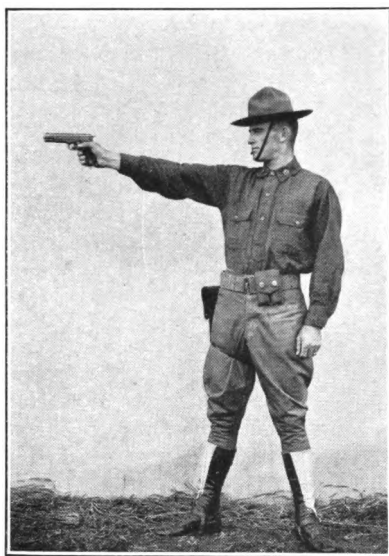


FIGURE 6.—Position of the body

8. Third step; trigger squeeze.—*a. Importance of correct trigger squeeze.*—(1) The recruit can readily learn to aim and hold the aim, either on the bull's-eye or very close to it, for at least 10 seconds. When he has learned to press the trigger in such a manner as not to spoil his hold he becomes a good shot. All men flinch in firing the pistol if they know the exact instant at which the discharge is to take place. This is an involuntary action which can not be controlled. A sudden pressure of the trigger may derange the aim slightly, but the extreme inaccuracy of a shot fired in this way is mainly due to the flinch; that is, the thrusting forward of the hand to meet the shock of recoil. Any man who holds the sights of the pistol as nearly on the bull's-eye as possible and continues to press on the trigger with a uniformly increasing pressure until the pistol goes off is a *good shot*. Any man who has learned to increase the pressure on the trigger only when the sights are in alignment with the bull's-eye, who holds the pressure when the muzzle swerves, and who continues with the pressure when the sights are again in line with the bull's-eye is an *excellent shot*. Any man who tries to "catch his sights" as they touch the bull's-eye and to set the pistol off at that instant is a *very bad shot*.

(2) The apparent unsteadiness of the pistol while being held on the bull's-eye does not cause much variation in the striking place of the bullet, due to the fact that the movement is of the whole extended arm and pistol. But the sudden pressure of the trigger, which always accompanies the flinch, deflects the muzzle of the pistol and causes the bullet to strike far from the mark. In squeezing the trigger the pressure must be *straight* to the rear. There is a tendency on the part of some men to press the trigger also to the left.

b. Calling the shot.—To call the shot is to state where the sights were pointed at the instant the hammer fell; thus, "high," "a little low," "to the left," "slightly to the right," "bull's-eye," etc. If the soldier can not call his shot correctly in range practice he did not press the trigger properly and consequently did not know where the sights were pointed when the hammer fell.

c. Trigger-squeeze exercises.—(1) *First exercise.*—(a) Required for this exercise a line of L targets with a firing point at 25 yards.

(b) Give the command: 1. *Inspection*, 2. *PISTOL*, and verify the fact that all pistols are unloaded.

(c) The squad leader explains to his squad the details of this exercise which are as follows:

1. Cock and lock the piece.
2. Take the correct grip.
3. Take the correct position.
4. Align the sights on the target and start the squeeze, gradually increasing the pressure on the trigger until all the strength of the hand is employed.
5. Rest the hand.
6. Repeat the above operation with the piece unlocked.
7. Call the shot.

(d) The squad leader assures himself that all the men understand the details of this exercise. The work is then carried on by pairs working together, coach and pupil. Members of the squad should change over frequently to avoid tiring the muscles of the arm. Extended trigger-squeeze exercise is necessary and the periods should be short but frequent.

(e) The duties of the coach are as follows:

1. See that the firer takes the correct grip.
2. See that the firer takes a correct position.
3. Watch the hand of the firer to see that he is gradually increasing the pressure on the trigger.
4. See that the firer rests his shooting hand after having unlocked the piece.
5. See that the firer calls the shot when the exercise is repeated with the piece unlocked.

(2) *Second exercise.*—(a) Give the command: 1. *Inspection*, 2. *PISTOL*, and verify the fact that all pistols are unloaded.

(b) The squad leader explains to his squad the details of this exercise, which are as follows:

1. Cock the piece.
2. Take the correct grip.
3. Take the correct position.
4. Align the sights on the target and start the squeeze. Close the eyes and continue to squeeze until the hammer falls.
5. When the hammer falls, open the eyes and check the aim to see if it has been deranged.

NOTE.—The firer should be able to keep on the target. If he is off persistently he should check on his grip and position to see that they are correct.

(c) The duties of the coach in this exercise are the same as in the first trigger-squeeze exercise.

(3) *Third exercise.*—In learning to fire the pistol, the average man has a tendency to push or punch forward with the arm or shoulder to meet the force of recoil of the piece. To assist the firer in overcoming this tendency the following exercise is prescribed: By command, verify the fact that all pistols are unloaded. The firer cocks and locks the piece, takes his firing position, aligns the sights under the bull's-eye and squeezes the trigger. The coach stands in front of the firer, facing him, and strikes the muzzle of the piece with the palm of his hand. At irregular intervals his hand misses the muzzle. The firer should hold the piece on the target and make no forward punching movement to meet the shock of the blow. If he does push forward with the arm or shoulder it will be apparent when the coach misses the muzzle.

9. Fourth step; rapid fire.—*a. Training for rapid fire.*—(1) Training for rapid fire is taken up after the trigger-squeeze exercise has been practiced sufficiently to be thoroughly understood, but the trigger-squeeze exercise practice in slow fire should be resumed and continued during the entire period of preparatory training.

(2) The time consumed in pressing the trigger must necessarily be shorter in rapid fire than in slow fire, but the process is the same.

(3) To fire the first shot, the pistol should be brought from the position of *raise pistol* by the shortest route to the aiming position, with the sights aligned on the mark. This is done by a smooth, rapid extension of the right arm straight from the shoulder, inserting the right forefinger in the trigger guard during the movement and holding the breath. To bring the pistol through the arc of a circle to the aiming position is an unnecessary loss of valuable time.

(4) For succeeding shots the sights should be held as nearly on the mark as possible and the breath held throughout the score. The recoil after each shot will throw the sights out of alignment, but they should be brought back to the mark immediately by the shortest route. The recoil should cause a vertical movement of the firing arm upward, the hand moving only 6 to 8 inches. There should be no snapping or bending of the wrist or elbow. The sights will then come back auto-

matically on the mark after each shot. To give the pistol a flourish between shots is a useless loss of time.

(5) To simulate the self-loading action of the automatic pistol take a strong cord about 4 feet long and tie one end to the thumb piece of the hammer, *the knot on top*. Take a few turns of the other end of the cord around the thumb or fingers of the left hand. The cord should be long enough to permit the left hand to hang naturally at the side while aiming the pistol with the right hand, right arm fully extended.

(6) Each time the hammer falls a quick backward jerk of the left hand recocks the pistol and at the same time jerks the sights out of alignment with the bull's-eye. This derangement of the alignment corresponds very closely to the jump of the pistol when actually firing.

(7) If the knot is underneath the hammer or if a very thick cord is used the hammer will not remain cocked when jerked back.

b. Rapid-fire exercise.—(1) Required for this exercise: A piece of strong cord $4\frac{1}{2}$ feet long for each man; a row of L targets or a row of aiming bull's-eyes.

(2) Give the command: 1. *Inspection*, 2. *PISTOL*, and verify the fact that all pistols are unloaded.

(3) Explain to the assembled command that the trigger squeeze is the same in rapid fire as in slow fire.

(4) Demonstrate the correct method of bringing the pistol by the shortest route to the aiming position. Show how this is done both from *raise pistol* and in drawing the pistol from the holster in an emergency.

(5) Show how to tie the cord to the thumb piece of the hammer and cause each man to adjust his cord.

(6) Demonstrate the method of cocking the pistol by means of the cord and explain how this simulates the self-loading action of the pistol.

(7) Show how the pistol is kept as nearly on the mark as possible during the whole score. Caution the men to avoid unnecessary flourishes or movements between shots.

(8) Demonstrate—

(a) The action of the pistol in recoil when a shot is fired.

(b) How the arm should not be permitted to bend at the elbow.

(c) How the pistol should move upward through a small arc and be deflected from the original point of aim only a short distance.

(d) How the forefinger should move forward after the explosion only far enough to allow the sear to become reengaged and immediately thereafter start pressing the trigger for the next shot.

(e) How the eye should not be allowed to close when the explosion occurs.

(f) How the breath should be held for each shot.

(9) (a) The above demonstrations having been completed, the men are placed in front of the line of targets in pairs, one to practice and one to coach. The exercise is then carried on exactly the same as rapid fire in range practice. If a line of disappearing targets has been arranged for this exercise the targets appear, remain in sight the allotted time, and then disappear. While the targets are in sight each man undergoing instruction attempts to fire five shots (simulated fire), cocking the piece for each shot, except the first, by a jerk of the cord with the left hand.

(b) If the targets are stationary the exercise begins with the command: 1. *Commence*, 2. *FIRING*, and ends with the command: 1. *Cease*, 2. *FIRING*.

(c) After each three or four scores of simulated fire the men of each pair are directed to change places, the firer becoming the coach and the coach becoming the firer.

(10) (a) In this exercise the coach watches the man carefully and corrects all errors in grip, position, trigger squeeze, and manipulation of the piece, paying particular attention to the trigger squeeze.

(b) Rapid-fire exercises should be frequent but not of long duration.

(c) It is advisable to extend the time limit several seconds when rapid-fire exercise is first taken up. The time limit is then gradually reduced until it corresponds to the time prescribed for range firing, record practice.

10. Fifth step; quick fire.—a. *Training for quick fire*.—(1) The training for quick fire is taken up after the rapid-fire exercise has been practiced sufficiently to be thoroughly understood. Thereafter, exercises in slow fire, rapid fire, and quick fire

should all be continued until the end of the period of preparatory training.

(2) For each shot the pistol is brought from *raise pistol* to the aiming position by the shortest route after the target appears.

(3) The pistol may be cocked after each shot in this exercise either by means of a cord, as in rapid-fire exercise, or by using the left hand to pull the hammer back after the position of *raise pistol* is resumed.

b. Quick-fire exercise.—(1) Required for this exercise: A line of E targets that can be operated as bobbing targets from a pit or screen, or a line of E targets so arranged on pivots that the edge can be turned toward the firer when the target is not exposed.

(2) Give the command: 1. *Inspection*, 2. *PISTOL*, and verify the fact that all pistols are unloaded.

(3) Explain to the assembled command that the trigger squeeze is the same in quick fire as in slow fire.

(4) Demonstrate the correct method of bringing the piece from *raise pistol* to the aiming position.

(5) Show how the pistol is cocked between shots when the left hand is used instead of the cord.

(6) The above demonstrations having been completed, the men are placed in pairs in front of the line of bobbing targets, one man of each pair to act as coach for the other man. The exercise is then carried on exactly the same as quick fire in range practice. The targets appear, remain in sight the allotted time, and then disappear. After the targets appear each man undergoing instruction brings his pistol from *raise pistol* to the aiming position, aims, fire one shot (simulated fire), and returns his piece to the position of *raise pistol*. After three or four scores of simulated fire the men of each pair are directed to change places.

(7) The coach watches carefully the man going through the exercises and corrects all errors in the grip, position, holding the breath, trigger squeeze, and the manipulation of the piece, paying particular attention to the trigger squeeze. It is advisable to extend the time limit about two seconds for each shot when quick-firing exercise is first taken up. The time is then gradually reduced until it corresponds to the time prescribed for range firing, record practice.

(8) When disappearing targets can not be provided for this exercise it may be held with stationary E targets. The command **Up** is given to signify that the targets are in sight, and the command **Down** to signify that they have been withdrawn.

(9) Practice in quick fire should be held frequently, but the periods of practice should not be of long duration.

(10) If the range is some distance from the area designated for preparatory exercises, or it is impracticable to arrange for a line of bobbing targets, L targets may be substituted for the bobbing targets.

11. **Sixth step; examination.**—At the completion of the preparatory instruction, the instructor should assure himself, by an examination, that every man thoroughly understands and can explain every phase of the preparatory training. The questions and answers given below are merely examples. Each man should be required to explain each item in his own words.

Instructor: Examine your pistol to see that it is unloaded.

Q. What are the safety devices of the pistol? **A.** The safety lock, the grip safety, the half-cock notch, and the disconnecter.

Q. Show me how you test the safety lock. **A.** I cock the pistol, move the safety lock up into place, and then grip the stock and see if the hammer remains up when pressure is applied to the trigger.

Q. Show me how you test the grip safety. **A.** I cock the pistol, see that the safety lock is down, and then without putting any pressure on the grip safety, I see if the hammer will remain up when a strong pressure is applied to the trigger.

Q. Show me how you test the half-cock safety device. **A.** I half cock the pistol, grip the stock, and see if the hammer remains at half cock when pressure is applied to the trigger. Then I take my finger off the trigger, pull the hammer back almost to full cock, and let go of it to see if it stops at half cock as it falls.

Q. Show me how you test the disconnecter. **A.** I cock the pistol and grip the stock; then with my left hand I move the slide to the rear a quarter of an inch; I then apply a strong pressure on the trigger and release the slide to see if the hammer will remain up. I also pull the slide fully back until it is held in place by the slide stop; I then grip the stock, apply a strong pressure on the trigger and release the slide by pressing down the slide stop with my left hand. The hammer should remain up after the slide moves forward into place.

Q. If the hammer does not remain up after the slide moves forward into place, what does it indicate? **A.** That with ball ammunition the pistol would continue to fire automatically as long as pressure is maintained on the trigger, which is very dangerous.

Q. If any of the tests of the safety devices fail at any time, what should you do? **A.** I should report the matter at once to my platoon or company commander.

Q. What is this [indicating a sighting bar]? **A.** A sighting bar.

Q. What is it used for? **A.** To teach men how to aim.

Q. Why is it better than a pistol for this purpose? **A.** Because the sights are much larger and slight errors can be more easily seen and pointed out.

Q. What does this represent? **A.** The front sight.

Q. What does this represent? **A.** The rear sight.

Q. What is this? **A.** The eyepiece.

Q. What is it for? **A.** To make the man hold his head in the right place, so that he will see the sights properly aligned.

Q. Is there an eyepiece on the pistol? **A.** No. A man learns by the sighting bar how the sights look when properly aligned, and he must hold the pistol while aiming so as to see the sights in the same way.

Q. Adjust the sights of this sighting bar so that they are in proper alignment with each other. [Verified by instructor.]

Q. Now that the sights are properly adjusted, have the small bull's-eye moved until the sights are aimed at it properly. [Verified by instructor.]

Q. Tell me what is wrong with this aim. [The instructor now adjusts the sights of the sighting bar on the bull's-eye with various very slight errors, requiring the man to point out the error.]

Q. Show me how you grip the stock of the pistol.

Q. Show me the position you take when you are going to shoot, standing; kneeling; prone.

Q. How do you squeeze the trigger? **A.** I squeeze it with such a steady increase of pressure as not to know exactly when the hammer will fall.

Q. If the sights get slightly out of alignment while you are squeezing the trigger, what do you do? **A.** I hold the pressure I have on the trigger and only go on with the increase of pressure when the sights become aligned again.

Q. If you do this can your shot be a bad one? **A.** No.

Q. Why? **A.** Because I can not flinch, for I do not know when to flinch, and the sights will always be lined up with the bull's-eye when the shot is fired, because I never increase the pressure on the trigger except when the sights are properly aligned.

Q. When you are practicing in slow fire and your arm becomes unsteady and your aim uncertain, what should you do? **A.** I should come back to raise pistol without firing the shot and then try again after a short rest.

Q. If it is impossible for you to hold the pistol very steady, can you still do good shooting? **A.** Yes; if I press the trigger properly.

Q. Tell me why that is. **A.** Because the natural unsteadiness of the arm moves the whole pistol and the barrel remains nearly parallel to the line of sight. But if I give the trigger a sudden pressure the front end of the barrel will be thrown out of line with the target, and the bullets will strike far out from the mark.

Q. What causes this deflection of one end of the pistol when the trigger is given a sudden pressure? **A.** The sudden pressure itself causes some of it, but most of it is caused by the flinch that always accompanies this kind of a trigger pressure.

Q. What does a man do when he flinches in shooting a pistol? **A.** He usually thrusts his hand forward as if trying to meet the shock by suddenly stiffening all his muscles.

Q. Must the trigger always be squeezed slowly in order to do it correctly? **A.** No. I squeeze it the same way in rapid fire and quick fire. The time is shorter but the process is the same.

Q. What is meant by calling the shot? **A.** To say where you think the bullet will hit as soon as you shoot and before the shot is marked.

Q. How can you do this? **A.** By noticing exactly where the sights point at the time the pistol is fired.

Q. If a man can not call his shot correctly, what does it indicate? **A.** That he did not squeeze the trigger properly and consequently did not know where the sights were pointed at the instant the discharge took place.

Q. Show me how you hold your breath while aiming.

Q. Take your pistol. Aim at that bull's-eye and squeeze the trigger a few times, calling the shot each time. [The instructor particularly notes the holding of the breath.]

Q. Show me how you come to a position of aim from *raise pistol*.

Q. Show me how you come to the aiming position in drawing the pistol from the holster in an emergency.

Q. Take this pistol with the cord tied to the hammer and fire a rapid-fire score at that target (simulated fire).

Q. Fire a score (simulated fire) at that quick-fire target. I will give the command *Up* when it is supposed to come into sight, and the command *Down* when it is supposed to be withdrawn from view.

Q. What do you do in case a cartridge misses fire? **A.** I bring the piece to *raise pistol*, grasp the slide with my left thumb and finger, pull the slide fully back and let go of it. This throws out the faulty cartridge and loads in another cartridge.

Q. Are there any points about pistol firing that you do not understand?

NOTE.—In all the demonstrations by the man undergoing examination the instructor carefully notes all points that are covered in the preparatory exercises. Each man will be put through a thorough test along the line indicated in these questions and answers before he is allowed to fire.

12. Gallery practice.—a. General.—Where facilities and equipment permit, all soldiers who have satisfactorily passed the examination on preparatory exercises should be advanced to gallery practice. The actual firing and observed results stimulate endeavor. Rapid progress, particularly in teaching trigger squeeze, may be made. There is no recoil nor loud report to induce nervousness or flinching and the soldier soon learns that he can make good scores if he observes the proper methods and precautions in which he has been instructed. Gallery practice is not only valuable to the beginner but it affords to the good shot a means of retaining his efficiency throughout the year. Continued practice is essential in maintaining pistol marksmanship.

b. Gallery practice course.—Prior to range firing the minimum number of scores shown in the following gallery practice table should be fired by each individual required to fire the pistol, dismounted. The procedure of firing is similar to that in range firing. No reports of the results of gallery practice are required but the firing record of individuals should be posted in order to stimulate interest and competition among the men of the organizations.

Gallery table

Range	Slow-fire target		Rapid-fire target		Quick-fire target	
	Iron gallery target or paper target X		Same as slow fire		Target E—Bobbing	
	Time	Scores	Time	Scores	Time	Scores
5 yards.....	No time limit.	2	15 seconds per score.	2	-----	-----
10 yards.....	do.....	2	do.....	2	-----	-----
15 yards.....	-----	-----	-----	-----	2 seconds per shot.	2

c. Additional practice.—In addition to the minimum number of scores prescribed in the table above, gallery practice should be carried on throughout the year, the amount and details of the practice being left to the discretion of the organization commander. Varied targets, such as tin cans, bottles, pendulums, and moving targets, stimulate interest. Matches between individuals and teams of the same or different units should be promoted during the year.

13. Coaching methods and organizations.—*a. Range practice.*—(1) The object of range practice is to teach the men to apply, with a loaded pistol, the principles of good shooting that they have learned during the preparatory exercises.

(2) Each man while firing must have a coach to correct him whenever he violates any of these principles.

(3) Slow-fire practice should be carried on until the men under instruction thoroughly understand the principles of good shooting.

(4) When rapid fire and quick fire are first taken up the time limit should be extended a few seconds. The time should then be gradually reduced until the scores are being fired in the time prescribed for record practice.

b. Dummy cartridges.—(1) Dummy cartridges are of great value in teaching both slow and rapid fire.

(2) *Dummy cartridges will not be used except on the firing line of the pistol range.* The same precautions will be observed as in using service ammunition.

c. Slow fire.—(1) The coach stands on the left side of the firer in such a position as to be able to observe his trigger finger,

his grip, his eye, and his position. It is the duty of the coach to correct all errors. The coach fills the magazines for the firer and hands them to him. At the beginning of range practice the magazines should be filled partly with service ammunition and partly with dummy cartridges. The firer must not know how many dummy cartridges are in the magazine or the order in which they are packed.

(2) The object of placing dummy cartridges in the magazine is to show the coach whether or not the man under instruction is squeezing the trigger correctly, and, in case of an improper trigger squeeze, to bring the fact forcibly to the attention of the firer himself. When a loaded cartridge is fired the flinch is often masked by the recoil of the pistol and the firer is not conscious of having flinched. When the hammer falls on a dummy cartridge, which the firer thinks is loaded, the sudden stiffening of the muscles and the thrusting forward of the hand to meet the shock that does not come are apparent to everybody in the vicinity, including the firer himself. The mixing of dummy cartridges with service ammunition causes the man to make a determined effort to press the trigger properly for all shots.

(3) The firing of scores with dummy cartridges and service ammunition should not be confined to the early stages of training. It is advisable to have some practice of this kind each day during the entire period of instruction practice. Many expert pistol shots use this form of practice in training for competitions.

(4) The following items of instruction are given to a pupil on beginning range practice, even though that person has already done a great deal of shooting. Once a person has been put through this instruction it is usually not necessary to repeat it during subsequent periods of range practice.

(a) Explain the method of grasping the piece.

(b) Show the amount of force used in gripping the stock by grasping the pupil's hand, saying: "This is too tight a grip" [gripping his hand very tightly]. "This is too loose a grip" [gripping his hand loosely]. "This is the right amount of force to use in gripping the stock" [gripping his hand with the firm but comfortable grip that should be used in shooting].

(c) Explain and demonstrate the position of the body, the feet, and the arm (par. 7 d, and fig. 6), and have the pupil assume this position.

(d) Explain the proper method of aiming.

(e) Explain that any man can aim and hold well enough for a good score. Have the pupil assume the proper position and aim at the target with an empty pistol without attempting to press the trigger, to see how long he can hold the sights on or near the bull's-eye. Explain to him that this aiming at the target with an empty gun demonstrates how near to the center his bullets will strike provided he presses the trigger properly.

(f) Explain the proper method of pressing the trigger.

(g) Have the pupil aim at the target with an empty pistol and then press the trigger for him several times, as described in *d* below (fig. 7), directing the pupil to call the shot each time the hammer falls.

(h) Have the pupil aim at the target with a loaded pistol and then press the trigger for him as described in *d* below, directing him to call the shot each time the piece is fired. Fire a score of five shots in this way.

(i) Have the pupil fire a score of five shots, pressing the trigger himself, to see if he can press the trigger properly and make as good a score as the one made when the coach pressed the trigger.

d. Squeezing the trigger.—One method of showing the men under instruction how to squeeze the trigger properly is to have him hold and aim the pistol while the coach presses the trigger. This is done in the following manner:

(1) The coach demonstrates the value of correct trigger press to the student by placing his hands in the position shown in Figure 7 and pressing on the end of the pupil's trigger finger with his left thumb. The coach cautions the pupil to neither assist nor resist the pressure which is put on the end of his trigger finger but to devote his whole attention to his aim and hold.

(2) The coach must be careful to apply a slow, steady pressure to the finger of the pupil and, at the same time, not interfere with the pupil's aim while applying this pressure. As a rule, the coach should consume from 5 to 10 seconds in putting sufficient pressure on the pupil's finger to fire the pistol.

(3) When pressing the trigger for a pupil as above described the coach should hold his head well to the rear to keep from having his left ear too near the muzzle of the piece.

(4) If the firer shows a tendency to apply the last part of the squeeze himself by giving the trigger a sudden pressure, he is directed to place his finger below the trigger guard, and the coach applies the pressure directly to the trigger instead of through the finger of the man under instruction.

e. Calling the shot.—Men should be required to call each shot in slow fire. If a man does not call the shot immediately after firing, the coach directs him to do so.

f. Coaching rapid fire.—(1) The firing of scores with dummy cartridges and service ammunition mixed is a very valuable form of rapid-fire practice. The coach fills the magazine in such a way that the firer can not know the order in which the cartridges are placed.

(2) The coach must watch the man closely, and each time he is seen to flinch, whether on a loaded or a dummy cartridge, the coach should caution him.

(3) When the hammer falls on a dummy cartridge the firer grasps the slide with his left hand, pulls it fully back, and releases it. This ejects the dummy and loads in another cartridge. The time limit must be extended to compensate for the time lost in ejecting the dummy cartridges. It should not take more than 2 seconds to eject a dummy cartridge and resume the aiming position.

g. Coaching quick fire.—(1) The use of dummy cartridges and the coaching methods are the same in quick fire as in rapid fire.

(2) The occasional use of dummy cartridges in both rapid fire and quick fire should be continued throughout the entire period of instruction practice.

h. Safety precautions on the range.—(1) Never place a loaded magazine in the pistol until you have taken your place at the firing point.

(2) Always remove the magazine and unload the pistol before leaving the firing point.

(3) Always hold the loaded pistol at the position of *raise pistol*, except while aiming.

(4) When firing ceases temporarily, lock the piece and hold it at *raise pistol*. Do not assume any position except *raise pistol* without first removing the magazine and unloading.

(5) If one or more cartridges remain unfired at the end of a rapid-fire or quick-fire score, remove the magazine and unload immediately.



FIGURE 7.—Coach pressing the trigger

i. Range organization.—(1) The work on the range should be so organized that no men are idle for any length of time. A good arrangement is four or six orders per target. It should never be necessary to assign more than six orders. If there is not a sufficient number of targets to provide for this, the extra men should remain off the range and be given other instruction.

(2) One method is to have a line of pistol targets on a flank of each firing point of the rifle range, so arranged that the firing points of the rifle range and of the pistol range are on one line. There should be about 50 yards interval between the rifle range and the pistol range. The targets may be placed on the ground instead of in pits. The bobbing targets are arranged to revolve on their own axis and are operated from behind the firing line by means of cords. When the targets are to be marked the whole line ceases firing, unloads pistols, and moves up to the targets to record the hits and paste the shot holes. In slow fire the coach can keep the firer informed as to the location of his hits by use of field glasses.

(3) When the time is short and range facilities and proper supervision permit, rifle firing and dismounted pistol firing may be carried on at the same time. While one group is firing on the rifle range the other is firing on the pistol range. As the men complete a score with the rifle they move to the pistol range and their places at the rifle-firing point are filled by men who have completed a score of pistol firing. As soon as all men present have completed their scores with the rifle the whole group moves back to the next firing point (moving the pistol targets if necessary) and continue as before with the alternate rifle and pistol firing.

(4) The pistol targets may be placed so that the line of fire is at right angles to the line of fire of the rifle range if the terrain permits. When it is not practicable to have pistol firing and rifle firing at the same time, other means will be adopted to keep the men occupied while they are not actually firing or coaching.

14. Instruction practice.—The following tables prescribe the firing in instruction practice in the order followed by the individual soldier. Target L is used in much of the practice, as the bull's-eye makes competition keener and shows up errors as no other target can. The tables apply to both automatic pistol and the revolver, when used.

*a. Slow fire.*TABLE I.—*Slow fire—Target L*

Range	Time	Scores (5 shots each), minimum
15 yards.....	No time limit.....	1
25 yards.....	do.....	1

Unlimited time is permitted for slow fire in order to permit proper explanation of the causes of errors and indication of corresponding remedies. It is intended to be the elementary phase of instruction in the proper manipulation of the weapon and for determining and correcting the personal errors of the firer.

*b. Rapid fire.*TABLE II.—*Rapid fire—Target L*

Range	Time	Scores (5 shots each), minimum
15 yards.....	11 seconds per score.....	1
25 yards.....	15 seconds per score.....	1

NOTE.—For the revolver the time allowance at 15 yards is 15 seconds and at 25 yards 20 seconds.

If pits are used, time is taken at the pits as in rapid fire rifle practice. If pits are not used time is taken at the firing point. The target being up, the soldier stands with the weapon at *raise pistol*, loaded and locked. The command: 1. **Commence**, 2. **FIRING**, is given and the soldier must fire one score within the prescribed limit of time, at the end of which the command: 1. **Cease**, 2. **FIRING**, will be given. Intervals of time are measured from the last words of the commands.

*c. Quick fire.*TABLE III.—*Quick fire—Target E—Bobbing*

Range	Time	Scores (5 shots each), minimum
15 yards.....	2 seconds per shot.....	2
25 yards.....	3 seconds per shot.....	2

15. Record practice.—The following tables prescribe the firing in record practice in the order followed by the individual soldier. The procedure is as in instruction practice.

*a. Slow fire.*TABLE IV.—*Slow fire—Target L*

Range	Time	Scores (5 shots each)
25 yards.....	No time limit.....	2

*b. Rapid fire.*TABLE V.—*Rapid fire—Target L*

Range	Time	Scores (5 shots each)
15 yards.....	11 seconds per score.....	2
25 yards.....	15 seconds per score.....	2

NOTE.—For the revolver the time allowance at 15 yards is 15 seconds and at 25 yards is 20 seconds.

*c. Quick fire.*TABLE VI.—*Quick fire—Target E—Bobbing*

Range	Time	Scores (5 shots each)
25 yards.....	3 seconds per shot.....	3

16. **Targets.**—*a. Target E.*—Target E is a drab silhouette, about the height of a soldier in a kneeling position, made of bookbinder's board or other similar material. (See fig. 8.) Hits are valued at 1. Any shot cutting the edge of the target is a hit.

b. Target E—bobbing.—Target E—bobbing is so arranged as to be fully exposed to firer for a limited time, edge of target toward firer when target is not exposed. (Fig. 9.)

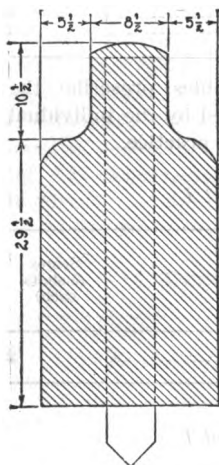


FIGURE 8.—Target E

c. Target L.—Target L is a rectangle 6 feet high and 4 feet wide, with black circular bull's-eye 5 inches in diameter and seven outer rings. (Fig. 10.) Value of hits in the bull's-eye, 10. The diameter of each ring and value of hits are as follows:

Diameter	Value of hit
8 1/4 inches.....	9
12 inches.....	8
15 1/4 inches.....	7
19 inches.....	6
22 1/4 inches.....	5
26 inches.....	4
46 inches.....	3
Outer, remainder of target.....	2

SECTION III

MARKSMANSHIP, MOUNTED

17. **General.**—The regulations and instructions governing pistol marksmanship, dismounted, apply to the mounted course unless obviously inappropriate, or except as noted herein.

18. **Preparatory instruction.**—*a. Instruction throughout the year.*—Mounted exercises with the pistol shall be carried on during the entire year. By exercises is meant simulated firing at different objects at all gaits. In practicing pistol attacks in field exercises the troopers will be required to observe the proper form in simulating firing.

b. Safety precautions.—In order to teach the trooper to handle his pistol with safety he will frequently be required to go through the motions of loading and unloading, locking and

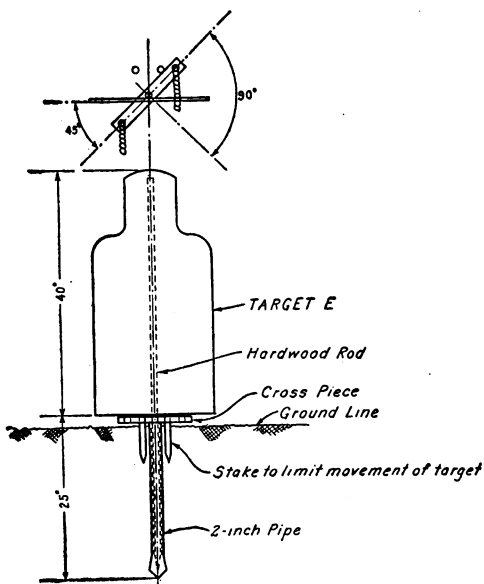


FIGURE 9.—Target E—bobbing

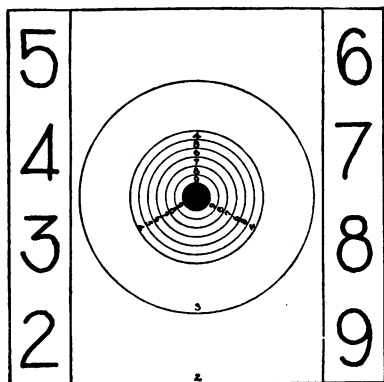


FIGURE 10.—Target L

unlocking the pistol while mounted, both at the halt and at all gaits. The troopers should also be practiced in withdrawing and inserting magazine at all gaits. During this preparatory instruction the trooper must be taught by exercises in simulated fire to observe the following rules. This will be done daily until the proper movements in their proper sequence become matters of habit and are instinctively performed when they become necessary.

(1) Always lock the pistol after loading and keep it locked until about to fire.

(2) When a cocked pistol is held in the hand it must always be held at *raise pistol* until it is locked, or until it is necessary to fire, load, or unload. If it becomes necessary to lower the pistol for any other purpose, the pistol must first be locked. Mounted men should never, under any circumstances, use both hands on the reins when the pistol is drawn.

(3) At the slightest misbehavior of the horse, the pistol must be locked. The trooper then makes a fresh start to complete his firing. If the horse rears, plunges, bolts, stumbles, or leaves the track, the trooper should instinctively lock the pistol.

c. Safety exercises.—In order to habituate the troopers to obey these rules the following exercises must be practiced frequently:

(1) The trooper, at *raise pistol* and with pistol cocked and locked, takes the track in front of the targets and unlocks the pistol. He then rides alternately off the track and onto it again, each time locking pistol as he leaves and unlocking pistol as he returns. This exercise is executed at all gaits. It simulates a misbehaving horse and teaches the trooper to lock pistol at once at the beginning of such misbehavior.

(2) The trooper, with pistol cocked and locked, takes the track at *raise pistol*. He now unlocks the pistol as if about to fire, and allows his bridle hand to slide along the reins until the latter are too long; whereupon he locks and returns pistol, and uses his pistol hand to assist in readjusting the reins. He next draws and raises pistol, continuing the exercise until he has passed the end of the track. This exercise is practiced at all gaits.

(3) Exercises for loading, unloading, withdrawing, and inserting magazine must be improvised and practiced at all gaits.

d. Simulated firing exercises.—With the targets set up as required for actual firing the trooper simulates fire to the right,

left, right front, left front, and right rear, bringing his horse to a halt upon the completion of each run. For firing, mounted, it is of special importance that the pistol be pointed in prolongation of the forearm, and not to the right of the forearm as is the common tendency. To enable men with average sized or smaller hands to avoid this tendency the pistol barrel is swung well to the left, even though only the tip of the index finger will then reach the trigger. These exercises should be made as realistic as possible, as a perfunctory execution of them is a waste of time.

(1) The trooper is given practice in simulating fire to the right (left) at the *walk* and the *gallop*. From *raise pistol* the trooper points his pistol by thrusting it toward the target by the shortest possible line, not by flourishing the weapon over the arc of a circle. This movement should be steady, easy, and smooth. In bringing the pistol downward he lowers the forearm in the direction of the target, keeping the elbow slightly bent, the forearm and pistol in the same straight line, and the wrist rigid. He then leans his body well toward the target, resting the bridle hand on the horse's crest, at the same time forcing the right elbow well to the left, thus getting the elbow in the same vertical plane as the wrist and shoulder. He then extends the forearm so as to thrust toward the target, keeping the elbow forced well to the left. There are thus four movements; leaning the body toward the target, lowering forearm and pistol, forcing elbow to the left, and a thrusting toward the target. Throughout the exercise he keeps his eyes fixed on the center of the target and concentrates his mind on making hits. (Figs. 11, 12, 13, and 14.)

(2) The trigger squeeze is started at the beginning of the thrust and is continued so that when the arm is fully extended, or the thrust completed, the squeeze is completed and the piece is fired. Upon completion of the thrust the target should be seen along the top of the pistol. If the next target is on the same side as the one just fired on, the body remains leaning well toward the target and the elbow is bent ready for the next thrust. During the processes of firing, the bridle hand remains on the horse's crest.

(3) In firing to the front (fig. 15), the trooper pushes his horse forward into the extended gallop and with reins gathered up short, leans well forward and extends his pistol arm as far as possible to the front over his horse's head. To accomplish

this, he should half stand in the stirrups. When the target is so low or so close that he can not point at it directly over his horse's head, the trooper may extend his arm by the side of the horse's head, being careful to have the muzzle of the pistol barrel well in front of the horse's face. He selects his target, fixes his eyes upon it with concentrated effort, catches sight of the target over his pistol barrel, and squeezes his trigger with steadiness and precision. He remains in this attitude simulating the firing of successive shots until he has passed the targets.

(4) In firing to the rear (fig. 16), the trooper applies the principles of arm extension, seeing the target over the pistol, and squeezing the trigger, as described in the preceding exercises; but instead of half rising in the stirrups and leaning forward, he sits well down in the saddle and rotates his body to the right and rear, being careful not to disturb his bridle hand nor to allow his lower legs to fly to the front.

e. Training horses.—Horses should be accustomed to the sight of barriers and targets and to the sound of firing. Targets placed in the corral and targets and barriers placed near the road to the drill ground, where the horses pass them frequently, soon familiarize them with the odd shapes and colors. A horse that shows fear of a target should not be forced up to it roughly but should be ridden close to the targets gradually and patiently. A practicable way of inuring horses to the sound of firing is to locate them on a picket line or otherwise in close proximity to the firing points during rifle and dismounted pistol practice. The training of horses to accustom them to the noise of firing should not be hurried. Calmness usually develops gradually. Horses should always be exercised before firing, in order to take the edge off. A group of horses stand firing more quietly than an individual horse. The most nervous horses should have quiet horses on either side during training. As they grow steadier, firing by individuals armed with revolver and blank ammunition should be done at drill in line formations and at increased gaits.

19. Range firing.—*a. Individual practice.*—(1) *Regular course.*—(a) *Construction of the course.*—The course will be laid out as shown in Figure 17. The length of the course, measured from start to finish, is 345 yards. In selecting the site for the course due weight will be given to the terrain and space requirements of the mounted saber course, which must

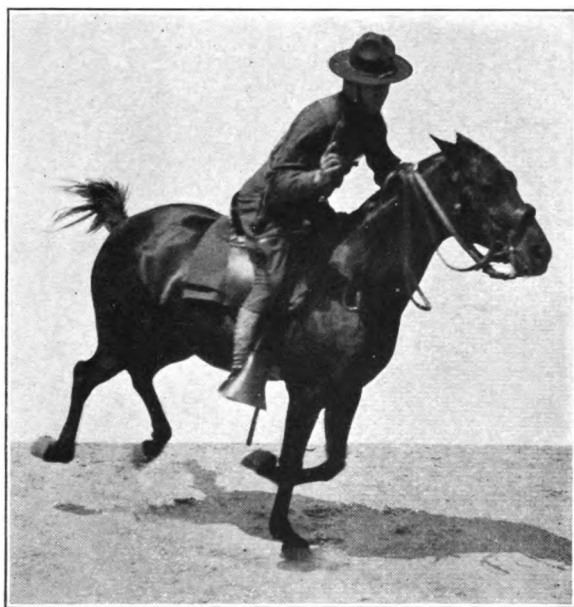


FIGURE 11.—Beginning the thrust



FIGURE 12.—The thrust continued

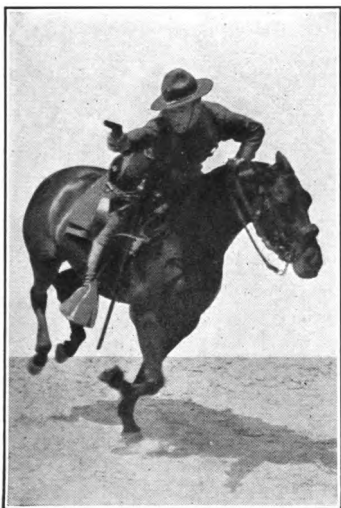


FIGURE 13.—Completed thrust



FIGURE 14.—Firing to the left



FIGURE 15.—Firing to the front

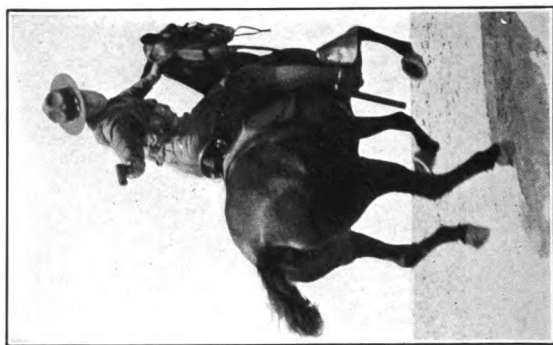


FIGURE 16.—Firing to the rear

be located near the mounted pistol course. All curves will be marked by flags or posts. All targets are of the M type and are located as shown by the numbers 1 to 14, Figure 17. Barriers at least 18 inches high will be placed as indicated by the heavy lines in Figure 17.

(b) *Marking, scoring, etc.*—The targets are designated Nos. 1, 2, etc., as indicated in Figure 17. The number of soldiers detailed as markers is left to the discretion of the officer conducting the firing. The following scheme for assignment of markers is suggested: Five markers are employed; one is assigned targets Nos. 1 and 14, one is assigned targets Nos. 2, 3, and 4, one is assigned targets Nos. 5, 6, and 7, one is assigned targets Nos. 11, 12, and 13, and one is assigned targets Nos. 8, 9, and 10. The markers take position approximately opposite their targets and on a designated line not less than 5 yards from the track, as shown in Figure 17. When a score has been fired, the markers run to their targets and call in numerical order the hits or misses; for example, "No. 1, a hit"; "No. 2, a hit"; "No. 3, a miss," etc. After calling the hits or misses the markers cover any shot holes with pasters and run back to their positions. One noncommissioned officer, detailed as scorer, is posted behind the markers at a convenient place to hear the calls. In record practice the scorers and markers should, when practicable, be from a troop other than the one firing. The regulations for scoring and recording scores in rifle practice will govern in mounted pistol firing as far as may be applicable. In record firing new paper covers for the silhouette targets will be used for each day's firing. Upon completion of the firing of each 10 scores, the officer conducting the firing will count the number of hits on each target and compare the totals with the recorded scores. If the examination of the targets gives a result which differs more than 2 per cent from the recorded scores, the 10 men who fired last will be required to repeat the firing and the markers and scorers will be cautioned to use greater care in marking and scoring, respectively.

(c) *Value of hits.*—Each hit on a target counts one point.

(d) *Defective cartridges and malfunctions.*

1. If a defective cartridge or a malfunction of the pistol causes a failure to fire at any of the targets from Nos. 1 to 7, inclusive, the firer will return to the starting point, at *raise pistol*, where he will correct

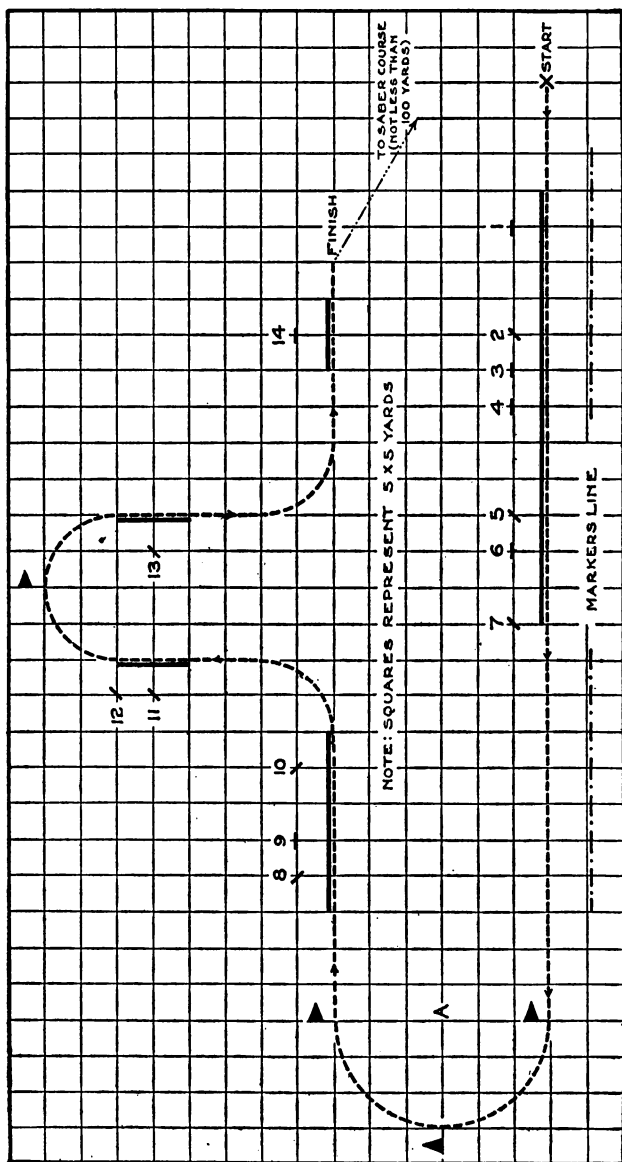


FIGURE 17.—Arrangement of targets for instruction and record practice

the defect. The pistol will then be loaded so as to provide one cartridge for each target numbered 1 to 7 at which he failed to fire. The firer will then start his run anew, firing on those targets only which he has previously failed to fire upon.

2. If a malfunction occurs between targets Nos. 7 and 8, the firer will return to the starting point, at *raise pistol*, where he will correct the defect, place an empty magazine in the pistol and draw the slide back. The firer will then start his run anew. After passing target No. 7 he will withdraw the empty magazine, insert a loaded magazine, and commence firing at target No. 8.
3. If a defective cartridge or malfunction of the pistol causes a failure to fire at any of the targets from Nos. 8 to 14, inclusive, the firer will continue around the track to the starting point, at *raise pistol*, where he will correct the defect. The pistol will then be loaded so as to provide one cartridge for each target numbered 8 to 14 at which he failed to fire. The firer will then start his run anew, firing at those targets only, from Nos. 8 to 14, inclusive, which he has previously failed to fire upon.

(e) *Time limit*.—The time limit for each run, measured from the instant the firer fires upon or passes target No. 1 up to the instant he fires upon or passes target No. 14, is 55 seconds. In case, due to a defective cartridge or malfunction, the firer is permitted to renew his run, the timing also starts anew, as prescribed for a regular run.

(f) *Horses*.—So far as practicable individual firers will be required to ride the horses regularly assigned them. In no case, in the Regular Army, will any horse be used by more than two individuals, nor will more than 25 per cent of the individuals of a troop be permitted to fire from horses other than those regularly assigned to them. Troop reports of Regular Army organizations relating to individual mounted pistol practice will contain a certificate to the effect that the provisions of this paragraph have been complied with.

(g) *Tabulation*.—Tables I and II relate to the divisions of the mounted course in the order to be followed in range practice.

(h) *Instruction practice.*

TABLE I

	Runs	Tar-gets	Range	Gait	Time limit
Firing to the right, left, right front, left front, and right rear.	Minimum of 2 runs of 14 shots each.	14 M	5 to 7 yards	Gallop..	55 seconds for each run.

Total minimum number of shots, 28.

1. The firer is equipped with saber, pistol, lanyard, field belt, and two loaded magazines of seven rounds each. Just prior to starting a run he inserts a loaded magazine, loads and locks the pistol, and takes the position of *raise pistol*. The other magazine remains in the magazine pocket. Starting with the gallop at X, the firer rides along and parallel to the barrier, as indicated in Figure 17, and fires at the first seven targets as he encounters them. When he has fired his seventh shot, the firer, continuing around the course at the *gallop*, changes magazines and then fires at the remaining seven targets. Upon changing magazines after passing target No. 7, the firer may place the empty magazine in any secure place most convenient to him, such as a shirt pocket, or inside the shirt, or he may if he so desires, return the magazine to the magazine pocket.
2. Prior to making a complete run as outlined in 1 above the trooper should be afforded practice in going through the course and simulating fire on all targets and going through the course firing blank cartridges from the .45 caliber revolver at each alternate target.
3. To accustom horses and riders to this type of firing and to minimize the chances of accidents, the first run of instruction practice may be divided into two phases, as follows:
 - (a) In the first phase the soldier fires ball cartridges at targets Nos. 1 to 7, removes empty magazine, and inserts another empty magazine while en route to target No. 8, and simulates fire on targets Nos. 8 to 14.

- (b) In the second phase the soldier, having an empty magazine in pistol and the slide held back by the slide stop, simulates fire on targets Nos. 1 to 7, removes the empty magazine, and inserts a loaded magazine while en route to target No. 8 and fires ball cartridges on targets Nos. 8 to 14. The slide is held back at the beginning of the run in order that, as the firer passes target No. 7, the slide will be in the position it normally would be in if actual firing had taken place on targets Nos. 1 to 7.

4. Penalties will be exacted as follows:

- (a) For each 5 seconds or fraction thereof in excess of the prescribed time limit of 55 seconds, one point will be deducted from the firer's score.
- (b) For each instance during a run that the horse assumes a gait other than the gallop, one point will be deducted from the firer's score. This penalty is not to be construed as applicable to a case where the horse in changing leads hits two or three beats of the trot.

(i) *Record practice.*

1. The individual record practice is fired in the same manner and with the same penalties as prescribed in (h) 1 and 4 above.

TABLE II

	Runs	Tar-gets	Range	Gait	Time limit
Firing to the right, left, right front, left front, and right rear.	2 runs of 14 shots.	14 M	5 to 7 yards.	Gallop.	55 seconds for each run.

Total shots, 28.

2. In record practice each individual armed with both pistol and the saber will be required to make a continuous run over the combined pistol and saber course. (Individuals not armed with the saber will run the pistol course only.) The time for the pistol

course and time for the saber course will be taken separately as prescribed in (e) above. A second similar continuous run completes the record practice.

(f) *Coordination with saber course.*—Upon completing a run the firer, while continuing the gallop toward the starting point of the saber course, releases the pistol slide, locks and returns the pistol to the holster, and draws saber. The saber hand need not be passed through the loop of the saber knot. The firer then enters upon the saber qualification course.

(2) *Special course.*—This course, or one approximating it, may be fired preparatory to field service when for any reason it may be impracticable to fire the regular course.

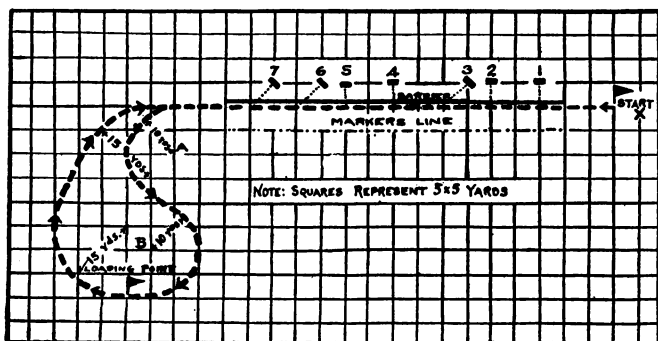


FIGURE 18.—Pistol marksmanship, mounted (special course), arrangement of targets

(a) *Construction of course.*—The course will be laid out as shown in Figure 18. The length of the course is 306 yards. The curves at A and B have a radius of 10 yards. The other curves have a radius of 15 yards. All curves will be marked with flags or posts. All targets are of the M type, and are located as shown by the numbers 1 to 7 in Figure 18. A barrier, at least 18 inches high, will be placed as indicated on the figure.

(b) *Marking, scoring, etc.*—The targets are designated No. 1, No. 2, etc., as shown in Figure 18. The number of men detailed as markers is left to the discretion of the officer conducting the firing. The markers take position approximately opposite their targets and on the designated line, not less than 5 yards from the track as shown in Figure 18. When a com-

plete score has been fired, the markers run to their targets, examine them, face the scorer, and call in numerical order the hits or misses, as for example, "No. 1, a hit," "No. 2, a miss," "No. 3, two hits," etc. After calling the hits or misses the markers cover any shot holes with pasters and run back to their position. One noncommissioned officer detailed as scorer is posted behind the markers at a convenient place to hear the calls. The regulations for scoring and recording scores in rifle practice will govern in mounted pistol fire as far as applicable.

(c) *Value of hits.*—Each hit on a target counts one point.

(d) *Defective cartridges and malfunctions.*—If a defective cartridge or a malfunction of the pistol causes a failure to fire at any of the targets, the firer will return to the starting point, at *raise pistol*, where he will correct the defect. The pistol will then be loaded so as to provide one cartridge for each target at which he failed to fire. The firer will then start his run anew, firing on those targets only which he has previously failed to fire upon.

(e) *Time limit.*—The time limit for each run is 45 seconds. The time is measured from the instant the firer fires upon or passes target No. 1, firing to the right, up to the instant he fires upon or passes No. 1 firing to the left. In case, due to a defective cartridge or malfunction, the firer is permitted to renew his run, the timing starts as prescribed for a regular run.

(f) *Individual practice.*

TABLE III

	Runs	Tar-gets	Ranges	Gait	Time limit
Firing to the right, left, left front, and right rear.	Minimum of 2 runs of 14 shots each.	7 M	5 to 7 yards	Gallop	45 seconds for each complete run.

Total minimum of shots, 28.

1. The firer is equipped with saber, pistol, lanyard, field belt, and two loaded magazines of seven rounds each. Just prior to starting a run he inserts a loaded magazine, loads and locks the pistol, and takes the position of *raise pistol*. The other magazine remains in the magazine pocket. Starting with the gallop at X, the firer rides along and parallel

to the barrier as indicated in Figure 18, and fires one shot at each of the targets numbered 1 to 7 as he passes them. When he has fired his seventh shot, the firer, continuing around the course at the gallop, withdraws the empty magazine and, after passing the flag at the loading point shown in Figure 18, inserts the second magazine, loads and locks the pistol, takes the position of *raise pistol* and fires one shot at each of the targets numbered 7 to 1 as he again passes them. Upon changing magazines, the firer may place the empty magazine in any secure place most convenient to him.

2. Prior to making a run as outlined in 1 above, the trooper should be required to go through the course, change magazines, and simulate fire on all targets and to go through the course and fire blank cartridges from the .45 caliber revolver at five targets selected at random.

b. Collective practice.—(1) *General.*—(a) After individual practice is completed collective practice is commenced by all rifle troops.

(b) The restrictions regarding the use of horses contained in *a* (1) (f) above do not apply to collective practice. Prior to the commencement of this practice, the commanding officer of each rifle troop will select from among the horses permanently assigned his troop those best trained for pistol firing. The horses so selected will be used in collective practice.

(c) This firing is practiced by squads. Men not belonging to permanent squads are either formed into squads or are used to replace absentees in permanent squads.

(d) A suitable marker will be placed on each side of the course, 35 yards from the line of targets, to indicate the line at which firing may commence. This line will be known as the firing line.

(e) After crossing the firing line, any trooper who is passed by the trooper on his right or left will cease firing, lock his pistol, and take the position of *raise pistol*.

(f) A suitable marker will be placed on each side of the course, 5 yards in front of the line of targets, to indicate a line beyond which there will be no firing. This line will be known as the safety line.

(g) When the squad reaches the safety line, or at any time in case of emergency, the whistle signal "Suspend firing" will be sounded. At this signal, all firing will cease, pistols will be locked, and the position of *raise pistol* will be taken.

(h) In these exercises the squad leader is the guide upon whom the troopers maintain their alignment and preserve their intervals.

(i) After passing beyond the targets, the squad leader halts the squad and gives the necessary commands for unloading and returning pistols. He then marches the squad off at a slow gait.

TABLE IV

Formation	Scores	Targets	Range	Gait
Exercise No. 1: Squad of 8 troopers in close-order line.	3 runs, each trooper firing 3 shots in each run.	8 targets E, suspended.	Between 35 and 5 yards.	Extended gallop.
Exercise No. 2: Squad of 8 troopers deployed as foragers at a minimum of 5-yard intervals.	-----do-----	9 targets M	-----do-----	Do.

NOTE.—The object of exercise No. 1 is to teach the men to fire to the front over their horses' heads while the squad is in line in close order. The object of exercise No. 2 is to teach the men to fire to the front at low targets while the squad is in line in extended order. Target M is a drab silhouette, representing a standing figure, made of bookbinder's board or similar material. It consists of two parts; the upper is target E and the lower is a trapezoidal piece whose upper edge is placed closely against the lower edge of target E. Hits are valued at 1. Any shot cutting the edge of the target is a hit.

(2) *Exercise No. 1.*—(a) Eight silhouette targets E, with $1\frac{1}{2}$ yards between centers, are suspended from a rope (or wire cable). The rope is stretched between poles erected 30 yards apart. The targets are suspended from the rope by any suitable means in such a manner that the lower edges of the targets when suspended will be about 10 feet from the ground.

(b) The squad is formed in line in close order facing the targets and at not less than 75 yards distance from them. The squad leader, posted as No. 1 of the left four, requires each trooper to load his magazine with three cartridges. He causes the squad to *load* and *raise pistol*, and then gives the necessary commands for putting the squad in motion and for increasing the gait to a gallop. The rate of the *gallop* is gradually increased until the squad is moving at approximately 16 miles

per hour when it reaches the firing line. When the squad reaches this line the leader commences firing; this is the signal for the other troopers to commence firing. Each trooper leans well forward and fires carefully and deliberately at the target directly in front of him. Firing ceases at the whistle signal, "Suspend firing."

(3) *Exercise No. 2.*—(a) Nine silhouette targets M, with a minimum interval of 5 yards between centers, are erected in line.

(b) The squad is formed in line in close order facing the targets, at not less than 100 yards distance from them. The squad leader, posted as No. 1 of the left four, requires each trooper to load his magazine with three cartridges. He causes the squad to execute *load* and *raise pistol*, and then gives the necessary commands for putting the squad in motion, for deploying it, and for increasing the gait to a *gallop*. The rate of the *gallop* is gradually increased until the squad is moving at approximately 16 miles per hour when it reaches the firing line. When the squad reaches this line, the leader commences firing; this is the signal for the other troopers to commence firing. Each trooper leans well forward and fires carefully and deliberately at the target to the right of the interval through which he is to pass. Firing ceases at the whistle signal, "Suspend firing."

SECTION IV

MANUAL OF THE PISTOL

20. General.—a. The movements hereinafter described differ in purpose from the manual of arms for the rifle in that they are not designed to be executed in exact unison. Furthermore, with only a few exceptions, there is no real necessity for their simultaneous execution. They are not therefore planned as a disciplinary drill to be executed in cadence with snap and precision, but merely as simple, quick, and safe methods of handling the pistol. Commands are prescribed for only such movements as may be occasionally executed simultaneously by the squad or larger unit.

b. In general, movements begin and end at the position of *raise pistol*.

c. Commands for firing, when required, are limited to *Commence firing* and *Cease firing*.

d. Whenever the pistol is carried mounted the lanyard will be used. The lanyard should be of such length that the arm may be fully extended without constraint.

21. Dismounted.—a. *To raise the pistol.*—The command is: 1. **Raise**, 2. **PISTOL**. Unbutton the flap of the holster with the right hand and grasp the stock, back of the hand outward. Draw the pistol from the holster; reverse it, muzzle up, the thumb and last three fingers holding the stock, the forefinger extended outside the trigger guard, the barrel of the pistol to the rear and inclined to the front at an angle of 30° , the hand as high as, and 6 inches in front of, the point of the right shoulder. This is the position of *raise pistol*.

b. *To withdraw the magazine.*—Without lowering the right hand, turn the barrel slightly to the right, press the magazine catch with the right thumb and with the left hand remove the magazine. Place it in the belt or otherwise dispose of it; in no case throw it away.

c. *To open the chamber.*—Withdraw the magazine and resume the position of *raise pistol*. Without lowering the right hand, grasp the slide with the thumb and the first two fingers of the left hand (thumb on left side of slide and pointing downward); keeping the muzzle elevated, shift the grip of the right hand so that the right thumb engages with the slide stop. Push the slide downward to its full extent, and force the slide stop into its notch with the right thumb, without lowering the muzzle of the pistol.

d. *To close the chamber.*—With the right thumb press down the slide stop and let the slide go forward. Squeeze the trigger.

e. *To insert a magazine.*—Without lowering the right hand, turn the barrel to the right. Grasp a magazine with the first two fingers and thumb of the left hand; withdraw it from the belt and insert it in the pistol. Press it fully home.

f. *To load the pistol.*—The command is: 1. **Load**, 2. **PISTOL**. If a loaded magazine is not already in the pistol, insert one. Without lowering the right hand, turn the barrel slightly to the left. Grasp the slide with the thumb and fingers of the left hand (thumb on right side of slide and pointing upward). Pull the slide downward to its full extent. Release the slide and engage the safety lock.

g. *To unload the pistol.*—The command is: 1. **Unload**, 2. **PISTOL**. Withdraw the magazine. Open the chamber. Glance at the chamber to verify that it is empty. Close the chamber.

Take position of *raise pistol* and squeeze the trigger. Then insert an empty magazine.

h. To inspect the pistol.—The command is: 1. **Inspection**, 2. **PISTOL**. Withdraw the magazine. Open the chamber. Take the position of *raise pistol*. The withdrawn magazine is held in the open left hand at the height of the belt. After the pistol has been inspected, or at the command 1. **Return**, 2. **PISTOL**, close the chamber, take the position of *raise pistol*, and squeeze the trigger. Insert an empty magazine, and execute *return pistol*.

i. To return pistol.—The command is: 1. **Return**, 2. **PIS-TOL**. Lower the pistol to the holster, reversing it, muzzle down, back of the hand to the right; raise the flap of the holster with the right thumb; insert the pistol in the holster and thrust it home; button the flap of the holster with the right hand.

22. Mounted.—*a. General.*—(1) The movements of *raise pistol*, *close chamber*, *return pistol* are executed as prescribed in paragraph 21 *a*, *d*, and *i*.

(2) The mounted movements may be practiced when dismounted by first cautioning **Mounted position**. The right foot is then carried about 20 inches to the right, and left hand to the position of the bridle hand.

(3) Whenever the pistol is lowered into the bridle hand, the movement is executed by rotating the barrel to the *right*. Grasp the slide in the full grip of the left hand, thumb extending along the slide, back of the hand down, barrel down and pointing upward and to the left front.

b. To withdraw the magazine.—Lower the pistol into the bridle hand. Press the magazine catch with the forefinger of the right hand, palm of the hand over the base of the magazine to prevent it from springing out; withdraw the magazine and place it in the belt, or otherwise dispose of it.

c. To open the chamber.—Withdraw the magazine. Grasp the stock with the right hand, back of the hand down, thrust forward and upward with the right hand, and engage the slide stop by pressure of the right thumb.

d. To insert a magazine.—Lower the pistol into the bridle hand. Extra magazines should be carried in the belt with the projection on the base pointing to the left. Grasp the magazine with the tip of the right forefinger on the projection, withdraw it from the belt, and insert it in the pistol. Press it fully home.

e. To load the pistol.—The command is: 1. **Load**, 2. **PISTOL**. Lower the pistol into the bridle hand. If a loaded magazine is not already in the pistol, insert one. Grasp the stock with the right hand, back of the hand down, and thrust upward and to the left front; release the slide and engage the safety lock.

f. To unload the pistol.—The command is: 1. **Unload**, 2. **PISTOL**. Withdraw the magazine. Open the chamber. Glance at the chamber to verify that it is empty. Close the chamber. Take the position of *raise pistol* and squeeze the trigger. Then insert an empty magazine.

g. To inspect pistol.—The command is: 1. **Inspection**, 2. **PISTOL**. (The pistol is inspected mounted only at mounted guard mounting. The magazine is not withdrawn.) Take the position of *raise pistol*. After the pistol has been inspected or at the command, pistols are returned.

I N D E X

	Paragraph	Page
Aiming :		
Apparatus required.....	6	10
Blank form used during period of preparatory instruction.....	6	13
Sighting exercise.....	6	11
Aiming disks.....	6	11
Assembling automatic pistol.....	3	2
Automatic pistol :		
Assembling.....	3	2
Care and cleaning.....	2	1
Disassembling.....	3	2
Automatic-piston marksmanship :		
Dismounted.....	4-16	5-34
Manual of the pistol.....	20-22	48-51
Mounted.....	17-19	34-48
Blank form used during period of preparatory instruction.....	6	13
Cleaning ; automatic pistol.....	2	1
Coaching methods and organizations :		
Dummy cartridges.....	13	27
Quick-fire.....	13	30
Range organization.....	13	31
Range practice.....	13	27
Safety precautions on the range.....	13	30
Slow fire.....	13	27
Squeezing the trigger.....	13	29
Disassembling automatic pistol.....	3	2
Dummy cartridges ; use in coaching.....	13	27
Examination at completion of preparatory instruction.....	11	23
Gallery practice :		
Additional practice.....	12	27
Course.....	12	26
Purpose.....	12	26
Horses ; training.....	18	38
Instruction and practice :		
Methods of instruction.....	5	7
Relative value.....	5	6
Scope of preparatory instruction.....	5	6
Instruction practice :		
Quick fire.....	14	32
Rapid fire.....	14	32
Slow fire.....	14	32

	Paragraph	Page
Manual of the pistol :		
Dismounted-----	21	49
General-----	20	48
Mounted-----	22	50
Pistol, automatic. <i>See</i> Automatic pistol.		
Pistol rest-----	6	10
Position :		
Essentials of proper-----	7	14
Exercises-----	7	15
Quick fire :		
Exercises-----	10	22
Training-----	10	21
Range firing :		
Collective practice-----	19	46
Individual practice-----	19	38
Rapid fire :		
Exercises-----	9	20
Training-----	9	19
Record Practice :		
Quick fire-----	15	33
Rapid fire-----	15	33
Slow fire-----	15	33
Safety precautions :		
On the range-----	13	30
Rules for-----	4, 18	5, 34
Tests-----	4	6
Sighting bar-----	6	10
Targets ; description-----	16	34
Training horses-----	18	38
Trigger squeeze :		
Exercises-----	8	17
Importance of correct-----	8	17



W 3.63:3 pt 1 / chap. 4

WAR DEPARTMENT

BASIC FIELD MANUAL



Volume III
BASIC WEAPONS

PART ONE
RIFLE COMPANY

CHAPTER 4
INSTRUCTION WITH THE BAYONET



THE HISTORY OF THE

OF THE

BFM, Vol III, Pt One, Ch 4
C 1

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 4

INSTRUCTION WITH THE BAYONET

CHANGES }
No. 1 }

WAR DEPARTMENT,
WASHINGTON, May 1, 1935.

Basic Field Manual, Volume III Basic Weapons, Part One Rifle Company, Chapter 4 Instruction with the Bayonet, March 1, 1932, is changed as follows:

33. Description of the course.—The course consists of eight dummies representing targets for parries, thrusts, jabs, and butt strokes, and two "E" targets that represent a fleeing enemy. A cardboard disk 6 inches in diameter will be pasted on each dummy, except the butt-stroke dummies (fig. 17) and the jab dummy (fig. 18), to serve as an aiming point for the thrust. On the dummy shown in figure 19 which requires a parry prior to the thrust, the cardboard disk will be so located as to make the parry necessary in order to score a hit on the disk. All long-thrust and butt-stroke dummies will be equipped with parry stick similar to figure 19.

[A. G. 062.11 (3-6-35).] (1935.)

35. Rules.

* * * * *

e. If a man for any reason fails to make a bona fide effort to attack any dummy in its turn with the prescribed thrust,

parry, jab, or butt stroke, he will not be credited with a hit on such dummy.

f. In order to be credited with a thrust, the soldier must have executed the thrust as prescribed in paragraphs 9 and 13 and the soldier's bayonet must have cut the cardboard disk and have penetrated the dummy.

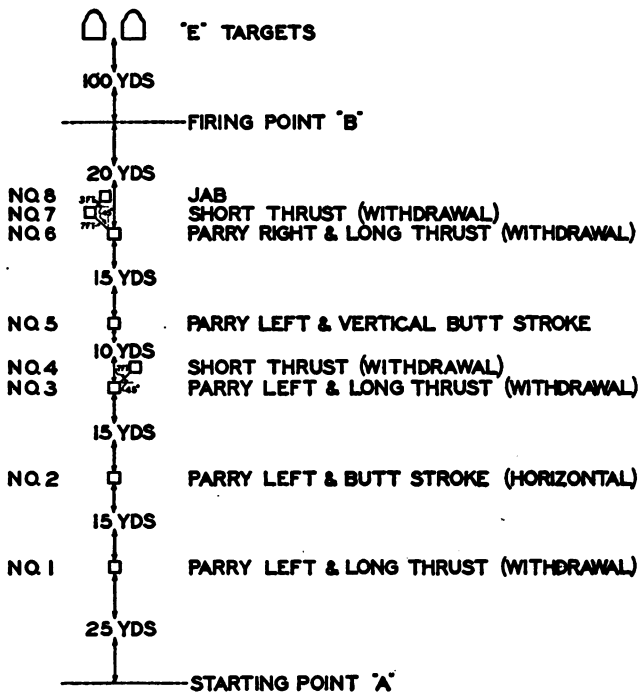


FIGURE 20.

g. In order to be credited with a butt stroke, the soldier must have completely knocked over the butt-stroke dummy with the butt. (1935.)

* * * * *

l. In order to be credited with firing at the "E" targets the soldier must reach the firing point before doing any simulation of fire, and no simulation of loading will be executed until after the soldier has arrived at that point. Credit will be given where he properly simulates loading, aiming, and firing.

m. The two "E" targets will be placed at a maximum distance of 100 yards from firing point (point "B", fig. 20). The exact distance to targets will depend upon local conditions.

36. Manner of running the course.—The soldier takes the prone position in rear of the starting point. At the command *Up*, he springs to his feet and with his piece at *high port* runs toward the first dummy. He attacks each dummy in turn and then continues to the firing point where he assumes the standing position without sling and **simulates firing** two aimed rounds, one at each "E" target. **The guard position will be assumed from the *high port* position at least 5 paces in front of dummies Nos. 1, 2, 3, 5, and 6.** Battle sight will be used.

[A. G. 062.11 (3-6-35).] (1935.)

38. Scoring.

* * * * *

b. * * *

Dummies and target	Points per parry	Points per butt stroke	Points per thrust	Points per jab	Points per shot (2)	Total maximum points
No. 1.....	2		6			8
No. 2.....	2	6				8
No. 3.....	2		6			8
No. 4.....			6			6
No. 5.....	2	6				8
No. 6.....	2		6			8
No. 7.....			6			6
No. 8.....				6		6
No. 9.....					4	8
Possible score with maximum time.....	10	12	30	6	8	66

[A. G. 062.11 (3-6-35).] (1935.)

BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,

*General,
Chief of Staff.*

OFFICIAL:

JAMES F. MCKINLEY,

Major General,

The Adjutant General.

BASIC FIELD MANUAL

Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 4 INSTRUCTION WITH THE BAYONET

**Prepared under direction
of the Chief of Infantry**



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932**

For sale by the Superintendent of Documents, Washington, D. C. - Price 5 cents

WAR DEPARTMENT,

WASHINGTON, *March 1, 1932.*

Chapter 4 (Instruction with the Bayonet), Part One (Rifle Company), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (4-13-31).]

BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,

***General,
Chief of Staff.***

OFFICIAL:

C. H. BRIDGES,

***Major General,
The Adjutant General.***

II

FOREWORD

Basic Field Manual, Volume III, Basic Weapons, will be published in six parts as follows:

PART ONE. Rifle company. (Each chapter of Part One will be published as a separate pamphlet.)

Chapter 1. Rifle marksmanship.

2. Automatic rifle marksmanship.

3. Automatic pistol marksmanship.

4. Instruction with the bayonet.

5. Instruction with hand and rifle grenades.

6. Musketry.

PART TWO. Fire-control instruments.

Chapter 1. Machine-gun instruments.

2. 37-mm. gun and 3-inch trench mortar instruments.

3. Care, repair, and adjustment of instruments.

PART THREE. Machine-gun company.

Chapter 1. Mechanical training with the machine gun.

2. Machine-gun marksmanship.

3. Technique of machine-gun fire.

4. Barrages and concentrations.

PART FOUR. Howitzer company.

Chapter 1. Mechanical training with the 37-mm. gun and the 3-inch trench mortar.

2. 37-mm. gun and the 3-inch trench mortar marksmanship.

3. Technique of the 37-mm. gun and the 3-inch trench mortar fire.

PART FIVE. Combat practice firing.

Chapter 1. General.

2. Rifle company.

3. Machine-gun company.

4. Howitzer company.

PART SIX. Antiaircraft marksmanship—Infantry weapons.

Chapter 1. General.

2. Rifle and automatic rifle.

3. Machine gun, caliber .30.

the same time, the government has been trying to control the price of rice, which is a staple food for the Chinese people. This has led to a shortage of rice in some areas, and the government has had to intervene to ensure that there is enough rice for everyone. The government has also been trying to control the price of other goods, such as oil and coal, which are also essential for the Chinese economy. This has led to a shortage of these goods in some areas, and the government has had to intervene to ensure that there is enough of these goods for everyone. The government has also been trying to control the exchange rate of the Chinese yuan, which has led to a shortage of foreign currency in some areas, and the government has had to intervene to ensure that there is enough foreign currency for everyone.

The government has also been trying to control the price of housing, which has led to a shortage of housing in some areas, and the government has had to intervene to ensure that there is enough housing for everyone. The government has also been trying to control the price of education, which has led to a shortage of education in some areas, and the government has had to intervene to ensure that there is enough education for everyone. The government has also been trying to control the price of healthcare, which has led to a shortage of healthcare in some areas, and the government has had to intervene to ensure that there is enough healthcare for everyone.

The government has also been trying to control the price of transportation, which has led to a shortage of transportation in some areas, and the government has had to intervene to ensure that there is enough transportation for everyone. The government has also been trying to control the price of communication, which has led to a shortage of communication in some areas, and the government has had to intervene to ensure that there is enough communication for everyone. The government has also been trying to control the price of entertainment, which has led to a shortage of entertainment in some areas, and the government has had to intervene to ensure that there is enough entertainment for everyone.

TABLE OF CONTENTS

	Paragraph	Page
SECTION I. General.....	1- 2	1
II. Preparatory training.....	3-31	6
III. The qualification course.....	32-38	22
IV. Equipment.....	39-43	28
V. Advice to instructors.....	44-48	29

v

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 4

INSTRUCTION WITH THE BAYONET

(The matter contained herein supersedes TR 50-25, December 20, 1923 (including C1, January 2, 1926; C2, January 2, 1928; and C3, January 2, 1929).)

SECTION I

GENERAL

1. Introduction.—*a. Spirit of the bayonet.*—(1) To teach the few simple technical details of bayonet combat is an easy matter, but an instructor's success will be measured by his ability to instill in his men the will to use the bayonet. This spirit is infinitely more than that displayed on the athletic field, and combined with confidence in the rifle and ability to shoot, constitutes the grim determination of the firing line to close with and destroy the enemy. It is the overwhelming impulse behind every successful bayonet assault.

(2) The fighting instinct of the individual soldier must be developed to its highest point by the instructor. It first appears in a recruit when he begins to handle the bayonet with facility, and increases as his confidence grows. With the mastering of his weapon there comes to him a sense of personal fighting superiority in physical conflict. He knows that he can fight and win. His practice develops skill and determination. Such a man will fight as he has trained; spiritedly and effectively.

(3) Successful training implies that men will use on the battlefield what they have learned on the drill ground. To do this, a man must move to the attack possessed not only of a

determination to win, but also of a perfect confidence in his primary arm, the rifle. Without this, a bayonet assault will fail. The man who bores in with determination enjoys the advantage of a superior morale. The man who waits to fence loses his own nerve and helps the enemy take heart. The enemy may have the longer weapon; in that case, the soldier gains the advantage by closing with his opponent, but gives his opponent the advantage if he stands off and fences.

(4) The growth of the spirit of the bayonet is fostered by short talks on what has already been accomplished with the bayonet. In a bayonet fight, the most courageous, best disciplined, and most skillful man wins; the will to use the bayonet and thorough training assure success.

(5) The perfect confidence of the soldier in his weapon is born only of thorough, constant practice, which is the very essence of bayonet training.

b. Development of the individual.—(1) It is vital that each man be taught to think and act for himself, and that there be no interval of time between the thinking and acting. To attain this end, the men are required to use their intelligence to the fullest extent by carrying out the practices, as far as possible, without command. The instructor will cause them to parry sticks, to thrust at a shifting target as soon as it is stationary, etc. In this phase of the training, the class should always work in pairs and act on the principle of coach-and-pupil alternately. This, in itself, tends to develop individuality and confidence. Sharp, jerky words of command produce mechanical movements of the piece and should be used as little as possible. Rapidity of movement and alertness of mind are taught by various quickening exercises and games which require quick thinking and instantaneous muscular response. Boxing, wrestling, and all kinds of rough-and-tumble fighting play an important rôle in the development of the individual, and may well go hand in hand with bayonet training.

(2) To attack effectively with the bayonet requires nerve, good direction, strength, and quickness during a state of extreme excitement and probable physical exhaustion.

(3) While actual bayonet combat is individual, each man must understand that he is fighting as part of a team and not for himself alone. It follows, therefore, that he must be familiar with the tactical employment of the bayonet. He must

not only know how, but when and when not to use it. For instance, it is absurd for a soldier to chase a retreating enemy to stab him in the back with a bayonet; he has a bullet in his rifle for just that situation.

c. Bayonet an offensive weapon.—It must always be remembered that the bayonet is essentially an offensive weapon. Rush straight at an opponent with the point threatening his throat and deliver the thrust wherever an opening presents itself. If no opening is obvious, one must be made by deflecting the opponent's piece. But keep boring in. The man who fails to get his thrust home when an opening presents itself for even one-fifth of a second may lose his life. Emphasis will be placed upon the execution of a vigorous, aggressive, violent attack, rather than upon the refinements of bayonet fencing.

2. Rules for training.—*a. Method of instruction.*—Each position or movement will first be demonstrated and all essential points explained by the instructor. The position or movement is shown again with the class observing each essential point, so that from the very beginning of his training the soldier is taught to use his eyes and brain. The class will next assume and practice at will the position or movement just explained and the most glaring faults will be corrected. After a working knowledge of the position or movement has been gained, practice in it will be continued with the men working in pairs as coach and pupil using either hand signals or the training sticks.

b. General rules.—(1) Scabbards will not be removed from the bayonets except for thrusting at dummies and practice at withdrawal boards.

(2) The guard, thrusts, withdrawals, parries, and the jab will be taught first with the left then the right foot forward. Later the men will learn to handle the rifle and bayonet both right-handed and left-handed.

(3) All of the positions and movements will be taught right-handed before any left-handed practice is allowed.

(4) The short thrust and jab naturally follow the long thrust in the sequence named. When executing these three movements in rapid succession, the withdrawal position after a long thrust is the starting position for a short thrust, and the withdrawal position after a short thrust is the starting position for a jab.

(5) When practicing long thrust or short thrust alone, the rifle is snapped back to *guard* from the withdrawal position.

(6) The withdrawal, once taught, will be made after every thrust.

(7) Ranks working together will always be far enough apart to prevent accidents when thrusts are being made. When thrusts are made advancing, the ranks will change positions by coming to *high port*, marching in double time past each other, and turning about. When working against dummies, men will always continue the movement past the dummies, which they will leave on their right.

(8) A target at which to thrust will always be clearly marked on all dummies.

(9) In all phases of instruction the inclination to stand off and fence must be constantly combated.

c. Formation.—(1) The group being in two ranks, to form for bayonet training, the command is: 1. *Form for bayonet training*; 2. *MOVE*. At the command *Move* the man in the rear rank, who has been previously designated as the base, assumes the position of *guard*. The remainder of the men in the rear rank run to the right and left, respectively, face to the front at three-pace intervals and assume the position of *guard*. Each front-rank man runs by the shortest route to a position ten paces from and immediately in front of his rear-rank man, faces about, and assumes the position of *guard*.

(2) To assemble, the command is: 1. *Assemble*; 2. *MARCH*. At the command *March*, the base man assumes the position of *attention*. All others close in at a run to their original position and assume the position of *attention*.

(3) When moving with bayonet fixed the rifle will be carried at *high port*.

(4) Ranks will change positions at the command *Change over*, by coming to *high port*, running past each other right shoulder to right shoulder, turning about, and assuming the position of *guard*.

d. Coach-and-pupil practice.—(1) Whether working with the training stick or by the signals, the vigor and spirit of the coach will be reflected in the work of the pupil. In handling the training stick or making the signals, the coach must be speedy and aggressive and encourage his pupil to attack in the most determined and offensive manner. The same desire to

win that makes the soldier close with his enemy in actual combat must drive the bayonet fighter at the training stick or the target indicated by the coach's signal. In addition, the coach must be constantly on the alert to detect and correct the errors of the pupil.

(2) In executing the movements by the signals, the point of the bayonet will follow the movement of the coach's hand regardless of the relative right or left. When the proper execution of a movement requires that the pupil advance, the coach will step to the rear quickly as he gives the signal in order that his pupil may move with the utmost freedom and vigor.

e. Signals.—(1) The system of training herein prescribed is based on the direct appeal to the pupil's brain through his eye. In practicing the various movements, the use of signals should be started as early as practicable. Their object is to train the men to see and avail themselves instantly of openings, thus coordinating the eye with the muscles. The signals were devised to supersede the vicious practice of turning bayonet work into a drill by the use of commands, which ignores the training of the soldier's eye, and deadens his initiative. These signals are not mere imitations of the movements they call for; imitations would be of little advantage to the pupil. The idea is to indicate with the master's hand an opening which the pupil perceives and acts upon.

(2) The signals, easily learned, will be used by the men working in pairs; one signaling, the other executing the movement called for. To signal for the following positions or movements, the coach will move as indicated:

(a) *Guard.*—Assume the position of *guard*, left hand at back, right elbow at side, right forearm pointing to front, fist closed.

(b) *Short guard.*—Same as *guard*, except that the arm is drawn straight to the rear until the fist is at the right side.

(c) *Long thrust.*—Clap the right palm, fingers apart and extended, to that part of the body toward which the soldier is to aim.

(d) *Short thrust.*—Same as long thrust, except that the fist is closed. If the man with the bayonet is not in the position of *short guard* or withdrawal from *long thrust* when he gets the signal, he comes to the position of *short guard* and executes *short thrust*.

- (e) *Jab*.—Place both closed fists under the chin.
- (f) *Parry*.—Strike a blow diagonally across the body in the direction in which the parry is to be made, fist closed. Follow by signal for *thrust*.
- (g) *Vertical butt strokes*.
1. Make an upper cut with right fist to indicate vertical butt stroke No. 1.
 2. A straight right from the shoulder for No. 2.
 3. For the slash following butt stroke No. 2, carry the right hand upward and over the left shoulder, fingers extended and joined, and slash downward.
 4. Deliver an over-arm blow to indicate the butt stroke following slash.
- (h) *Horizontal butt strokes*.
1. Make a right hook to indicate a horizontal butt stroke.
 2. Carry the right hand over the left shoulder, fingers extended and joined, and slash horizontally toward the right to indicate the slash following the horizontal butt stroke.
- (i) *Out-under*.—Describe an arc downward and forward with the right hand, fingers extended and joined, in the direction the disengage is to be made. Follow by signal for *thrust*.
- (j) *Out-over*.—Describe an arc upward and forward as above.

SECTION II

PREPARATORY TRAINING

3. *Vulnerable parts of the body*.—The point of the bayonet should be directed against the opponent's throat, especially in hand-to-hand fighting, so that the point will enter easily and make a fatal wound on penetrating a few inches. Other vulnerable and frequently exposed parts are the face, chest, lower abdomen, thighs, and, when the back is turned, the kidneys. The armpit, which may be reached with a jab if the throat is protected, is vulnerable because it contains large blood vessels and a nerve center.

4. *Guard*.—*a. Description of position*.—The point of the bayonet is directed at the base of the opponent's throat, the rifle held firmly but not rigidly with both hands without canting. The left hand, palm against the side of the rifle, is at

the most convenient position in front of the rear sight so that the left arm is only slightly bent, the right hand, palm to the left, grasping the small of the stock and the right forearm pressing the upper part of the butt to the body. The legs are separated as in taking a natural step and meeting with resistance; left foot leading, both knees slightly bent, the leading knee, more; feet separated laterally a few inches and both feet flat on the ground, toes pointed as the man naturally points them in walking. The weight is balanced on both legs. The position must not be constrained in any way, but must be one



FIGURE 1.—Guard

of aggressiveness, alertness, and readiness to spring forward for instant attack. (Fig. 1.)

b. Common faults.—(1) Body inclined backward.

(2) Left arm too straight or bent too much.

(3) Right hand held too low and too far back.

(4) Rifle gripped too rigidly, restraining all freedom of motion.

5. Short guard.—The left hand grasps the rifle just under the stacking swivel, left arm slightly bent, right hand grasping the small of the stock and resting against the right hip. The point of the bayonet is directed at the base of the opponent's throat. The body, legs, and feet are as in *guard*.

6. Rest.—To assume the position of *rest* from *guard*, lower the piece smartly to the side, butt resting on the ground near the right foot, the right hand grasping the piece above the lower band. The feet remain as in the position of *guard*.

7. High port.—From the position of *guard*, without changing the grasp of the hands, carry the piece diagonally across the body until the left wrist is level with and in front of the left shoulder. (Fig. 2.)

8. Jumping trenches.—Jumping trenches and surmounting obstacles will usually be done by throwing the piece sharply forward and upward from the *high port* on taking off and bringing it back in on landing. This jumping will also be practiced with the position of the piece approximately maintained with the left hand alone, leaving the right hand free. The men will also be trained to jump holding the rifle in the *guard* position and snapping it up quickly on taking off. The grasp of the hands remains the same, and the piece is started down when the man is at the highest point in his jump, thus bringing him down in a good position for thrusting. These jumps apply the principle of jumping with weights.



FIGURE 2.—High port

9. Long thrust.—*a. Description of movement.*—(1) The rifle is gripped with all possible strength and the point is driven vigorously from the *guard* position to the full extent of the left arm, quickly extending the whole body to the front, butt running along the inside of and against the right forearm.

In delivering the thrust, the right elbow is carried low and the butt remains between the right forearm and the body. The leading knee and ankle are well bent, the rear leg braced with the heel raised, the body inclined well forward.

(2) The power of the thrust comes from the right arm, the shoulders, the back, the legs, and weight of the body. The left arm is used more to direct the point of the bayonet. A vigorous thrust delivered without advancing throws a man off balance, but in fighting he preserves his balance by stepping in with the rear foot as he thrusts. After a man has learned the details of a thrust, it will always be delivered while advancing.

The eyes must be fixed on the object at which the thrust is made. In making thrusts other than straight to the front, the leading foot should move laterally in the direction in which the thrust is made.

(3) The long thrust is made at an opponent at a range of five feet from the attacker's eye. It is very important to be able to judge this distance. In advancing on a dummy, men are prone to let the momentum of the body carry the point through the dummy without making the thrust. This must be guarded against, as it brings the point forward at the same rate of speed as the body, which is fairly uniform and easily judged.



FIGURE 3.—Long thrust

The darting forward of the point at the last instant gives a speed that is more difficult to judge. (Fig. 3.)

b. Common faults.—The following faults should be guarded against in executing long thrust:

- (1) Rifle drawn back just before delivering the thrust.
- (2) Elbow and butt of the rifle held as high as or against the right shoulder.
- (3) Eyes not directed at the point thrust at.
- (4) Leading knee not sufficiently bent.
- (5) Body not inclined far enough forward.
- (6) Point not going forward on a straight line.
- (7) Butt not braced against the inside of the right forearm.
- (8) Thrust made with the arms alone and not with the power of the whole body.

10. Withdrawal from long thrust.—*a. Description.*—To withdraw the bayonet after a long thrust has been delivered, the left hand is slipped toward the stacking swivel, the rifle

is jerked straight back along the line of penetration with the force and weight of the entire body until the right hand is behind the hip, this without unduly relaxing the grip of the small of the stock, and the *guard* position is immediately resumed. The weight of the body is carried to the rear by straightening out the leading leg and straightening the body at the waist. The foot in rear will be advanced quickly as the left hand is slipped forward unless the proximity to the object transfixes renders it unnecessary. After every thrust, a rapid



FIGURE 4.—Withdrawal from long thrust

withdrawal is made before coming to *guard*. In combat, a quick withdrawal is necessary to get ready to meet another enemy, and to prevent the one just stuck from wrenching the rifle from the bayonet fighter's hands in falling. (Fig. 4.)

b. Common faults.—The following common faults should be guarded against in the execution of withdrawal from long thrust:

- (1) Not making the withdrawal vigorously enough.
- (2) Not drawing bayonet back on line of penetration; that is, letting the butt drop.

11. Long thrust at changing targets.—The class working in pairs with the instructor supervising will be practiced without word of command in thrusting at various directions, as—

a. At the opposite man's hand, which is placed in various positions on the body.

b. At thrusting rings on the ends of training sticks.

12. Long thrust at disks on dummies.—*a.* The men will be taught to transfix a disk or circle painted on a dummy, first from a halt at a distance of about five feet from the dummy

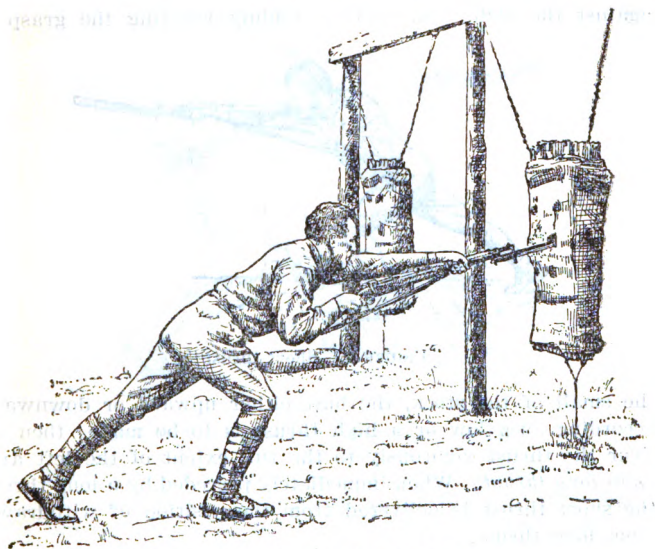


FIGURE 5.—Long thrust at swinging dummy

(that is, extreme range of the bayonet), and then, after advancing three or more paces. Later, the distance and speed are increased as the men progress. The advance must be made in a practical and natural way, and will be practiced with either foot to the front when the thrust is delivered. The rifle will not be drawn back just before making a thrust in a forward movement. The impetus of the body and the forward stretching of the arms supply the maximum force. (Fig. 5.) The bayonet must be withdrawn immediately after the thrust

has been delivered and a forward threatening attitude assumed to the side of or beyond the dummy. Unless the rifle is firmly gripped, it is likely to injure the hand. By gripping the rifle as far back on the small of the stock as the comb permits, the forefinger will be saved from being cut by the trigger guard.

b. To guard against accidents, the men will be at least five feet apart when the practice is carried out collectively.

13. **Short thrust.**—*a.* If at the position of *guard, short guard* is assumed by shifting the left hand quickly toward the muzzle and drawing the rifle back until the right hand is against the right hip, without unduly relaxing the grasp of



FIGURE 6.—Short thrust

the small of the stock, the butt either upward or downward, according as a low or a high thrust is to be made; then deliver the thrust vigorously to the full extent of the left arm, as in *long thrust*. When immediately preceded by a long thrust, the short thrust is delivered from the position of withdrawal from long thrust.

b. The short thrust is used at a range of about three feet, and in close fighting it is the natural thrust made when the bayonet has just been withdrawn after a long thrust. (Fig. 6.)

14. **Withdrawal from short thrust.**—Withdrawal from short thrust will be practiced in two ways:

a. In the same manner as withdrawal from long thrust.

b. If a strong withdrawal is necessary or the short thrust is to be followed immediately by the jab, the right hand is slipped up in rear of the left hand after the short thrust has been made. (Fig. 7.)

15. **Short thrust at changing targets and at dummies.**—The principles of delivering the long thrust at changing targets and at dummies will be observed in so far as they apply. By placing two or more disks or circles on the dummies, the short thrust may be taught in conjunction with the long thrust, the first disk being transfixcd with the long, the second with the short thrust.



FIGURE 7.—Withdrawal from short thrust

16. **The jab.**—*a. Description of movement.*—Immediately following the withdrawal from short thrust the rifle is brought to an almost vertical position, close to the body, along the outside of the right leg, butt near the right foot. From this position, stepping in if necessary, the knees are bent and, with the full force of the body, the point of the bayonet is jabbed upward into the throat or other part of the opponent. After any move that carries the point beyond the enemy, the bayonet fighter comes immediately to the short thrust or jab position; that is, he keeps the point between himself and his enemy. (Fig. 8.)

b. Common faults.—The following common faults should be guarded against in executing the jab:

- (1) Rifle drawn backward and not held upright enough.
- (2) Rifle grasped too low with the right hand.

(3) All the work done with the arms without putting the whole body into it.

(4) Rifle not pressed against the leg.

(5) Jab too high and not vigorous enough.

17. Parry right (left).—*a. Description of the parries.*—

(1) From the position of *guard*, the body is forced forward to the full extent of the reach and the left arm is straightened vigorously without bending the wrists or twisting the rifle in the



FIGURE 8.—The jab

hands, at the same time engaging the opponent's piece and deflecting it just clear of the body. The barrel is kept up, the point threatening the opponent's body, preferably his throat. If *parry right* is properly made, it is easy to kill the opponent with the thrust which immediately follows. In fact, the opponent will usually impale himself on the point. In *parry left*, the point is carried out of line with the opponent's body, but can be brought back quickly, as it is nearer this line than the opponent's point. *Parry left* is followed up at once either with a thrust or a butt stroke to the ribs or jaw. During the parry, the eyes must be kept on the weapon being parried; but having

completed the parry, they are instantly fixed on the part of the opponent's body to be attacked.

(2) Emphasis will be laid on the forward movement of the rifle and body. Very little lateral movement of the rifle is necessary in order to deflect the point of the opponent's bayonet enough to permit driving home a thrust.

(3) Men will be taught to regard the parry as an offensive movement and so execute it. (Figs. 9 and 10.)



FIGURE 9.—Parry right



FIGURE 10.—Parry left

b. Common faults.—The following common faults should be guarded against in the execution of the parry:

- (1) Wide sweeping parry with no forward movement in it.
- (2) Eyes taken off the weapon being parried.
- (3) Making the arms do all the work and not getting the weight, strength, and momentum of the body into the parry.
- (4) Lack of force in the parry.

18. *Parrying the training stick.*—The class will work in pairs. One man thrusts with the padded end of the training stick and the other parries. The *guard* position is resumed after each parry. Later the man with the rifle advances as he parries, executes a long thrust followed by a withdrawal, and resumes the position of *guard*. At first this prac-

tice must be slow and deliberate without being mechanical. It should be increased in rapidity and vigor as the instruction progresses. Care will be taken that the man thrusting with the stick does not swing it into the man with the rifle. If sweeping movements are made with the stick, the man with the rifle will probably develop sweeping parries. (Fig. 11.)

19. **Methods of injuring an opponent.**—*a.* It should be impressed upon all that, although a man's thrust has missed or has been parried, or his bayonet has been broken, he can, as attacker, still maintain his advantage and injure his opponent.

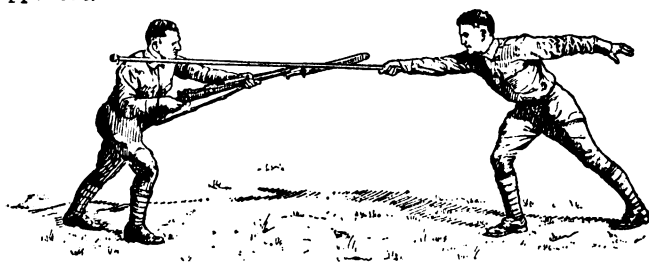


FIGURE 11.—Parrying the training stick

b. In individual fighting in the open, the butt can be swung horizontally against the opponent's jaw or other vulnerable parts. This method is impossible in trench fighting or in an attack, owing to the horizontal sweep of the bayonet to the attacker's left. Here the butt must be swung in the vertical plane. In many instances, a kick to kneecap or crotch will aid the butt stroke. *A butt stroke or kick will only temporarily disable an enemy*, and it should be clearly understood that the butt must not be employed when it is possible to use the point of the bayonet effectively.

20. **Vertical butt strokes.**—*a. Butt stroke No. 1.*—Swing up the butt at the opponent's crotch, ribs, forearm, or any exposed part of the body, using a half-arm blow, advancing with the rear foot. (Fig. 12.)

b. Butt stroke No. 2.—If the opponent jumps back so that the first butt stroke misses, the rifle will come into a horizontal position over the left shoulder, butt leading. The attacker will then jump in and dash the butt into his opponent's face.

c. Slash.—If the opponent retires still farther out of range, the attacker again closes up and slashes his bayonet down on the opponent's head, or the neck if the opponent is wearing a steel helmet. In the event of missing he will then be in the *guard* position.

d. Butt stroke No. 3.—If the point is beaten or brought down, the butt can be used effectively by crashing it down on the opponent's head with an over-arm blow, advancing the rear foot. When the opponent is out of distance, the slash can again be used. The attacker will then be in the *guard* position.



FIGURE 12.—Vertical butt stroke to crotch

21. Horizontal butt strokes.—*a. Butt stroke No. 1*—With a half-arm blow swing the butt up at opponent's jaw, advancing the rear foot. (Fig. 13.)

b. Butt stroke No. 2.—The butt can now be dashed into the opponent's face as described under vertical butt stroke No. 2 above.

c. Slash.—If the opponent jumps back so that the first stroke misses, the rifle will come into horizontal position over the left shoulder, butt leading. The attacker will then step in with the rear foot and slash the bayonet against the opponent's head or neck. If the opponent retires farther out of range, the attacker will be in the *guard* position.

22. Obtaining good direction and quickness with the training stick.—The men work in pairs as coach and pupil, the pupil with the rifle in the *guard* position and the coach with the training stick. As the coach approaches and places the ring or padded end of the training stick on the ground near the pupil, the latter comes to *guard* and threatens the coach with his point as long as he is sufficiently near to attack.

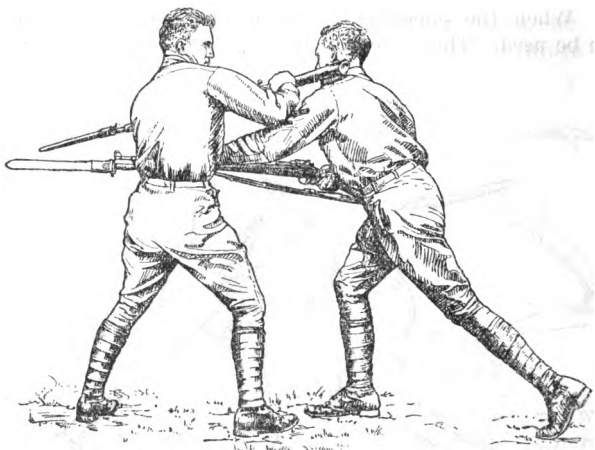


FIGURE 13.—Horizontal butt stroke to head

The coach then offers the ring or padded end of the stick in varying positions:

a. If the ring is presented, the pupil attacks with a thrust or the jab as the distance between his point and the stick indicates. If the ring is holed, the withdrawal is made and the position of *guard* resumed. If the first effort is a miss, the pupil will come on with short thrust and jab until successful.

b. If the coach presents the padded end of the stick, the pupil makes butt stroke No. 1 at it. If this is a miss, he comes on with butt stroke No. 2, etc., until he hits the padded end. As soon as he hits it, he resumes the *guard*. To practice the pupil in all the butt strokes, the coach jerks the stick away a short distance just before butt stroke No. 1 hits it, causing the pupil to miss and come on with butt stroke No. 2. Just

before butt stroke No. 2 hits the stick, the coach again jerks it away, causing the pupil to miss and come on with the slash.

c. If the padded end of the stick is thrust at the man with

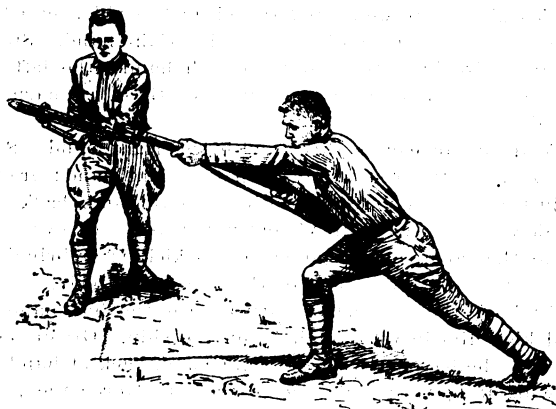


FIGURE 14.—Long thrust at the training stick

the bayonet, he parries as described in paragraph 18. (Figs. 14 and 15.)

23. Hand-to-hand fighting.—Butt strokes can only be used in certain circumstances and positions, but if men acquire absolute control of their weapons under these conditions, they will be able to adapt themselves to all other phases of hand-to-hand fighting. For instance, when a man is gripped by an opponent so that neither the point nor the butt can be used, the knee brought up against the crotch or the heel stamped on the instep may momentarily disable him and make him release his hold. It must be remembered, however, that

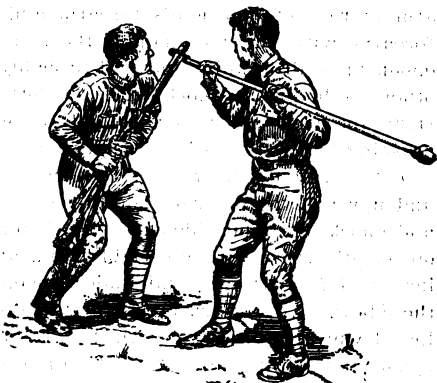


FIGURE 15.—Jab at the training stick

may momentarily disable him and make him release his hold. It must be remembered, however, that

this means of attack merely disables temporarily and should be followed immediately by an attack which will completely disable.

24. To disarm an opponent armed with a rifle.—*a.* Close in fast and fend off opponent's thrust with right hand. Step forward and seize his left hand with both hands, the left under his palm, the right over his fingers. Give a sharp twist outward.

b. Fend off opponent's thrust with the right hand. Step in and seize his left wrist firmly with the right hand; grasp the rifle just below the bayonet with the left hand, back of the hand down, and swing it violently upward and over to the right, at the same time stepping in and kicking or bringing the left knee into the lower part of the opponent's body.

c. Fend off the opponent's thrust with the left hand; step in and kick him in the crotch or on the shin. Grasp the rifle just below the bayonet with the right hand, back of hand down, and swing it upward and over to the left; force the point of the bayonet to the ground, and, stepping in, back-heel the opponent.

25. To disarm an opponent armed with a knife.—*a. Overhand attack.*—Close in fast, block the knife arm before it becomes extended, with the right forearm. Carry the left forearm in rear of opponent's forearm and grasp your own right forearm with the left hand. Backward pressure will cause opponent to drop knife and will probably break his elbow. Another method is to block with the left forearm, carrying the right forearm under and behind opponent's upper arm and grasping left wrist with the right hand.

b. Underhand attack.—As the blow of the knife comes in and upward, the disarmer sidesteps quickly outside the thrust and knocks the arm aside with his left forearm. He then grasps opponent's wrist with his right hand, at the same time carrying his left arm over and under opponent's knife arm above the elbow. An upward pressure with the left arm and a twisting downward pressure with the right hand will cause the opponent to drop the knife and will probably break his elbow.

26. Wooden rifle combat.—*a.* Wooden rifle combat, like boxing and wrestling, introduces into the training that most important element, personal contact, without which instruction

in fighting methods is incomplete. Training in this phase of bayonet work should be included whenever practicable.

b. The work is slow at first, the men gradually increasing their speed until they come together at full tilt. Protective equipment will always be worn. The practice is begun with both participants standing still; both then advance at a walk; then one advances at a run while the other stands still and finally both advance at a run.

27. Success in wooden rifle combat.—a. The soldier will win consistently in wooden rifle combat only as he has developed aggressiveness, skill, and speed. In particular, the ability to score hits over an opponent will depend upon a lightninglike parry and thrust; upon the effective handling of the wooden rifle in close fighting; and upon the ability to see and avail himself quickly of any opening.

b. In addition, the successful attack is the one which most effectively conceals from the opponent the intended point of attack, as—

(1) *Cut-under*.—If the opponent's point is held high, drop the point of the bayonet slightly with the left hand and bring it up on the opposite side of opponent's piece, coming in at the same time. The point should go forward about a foot in the act of passing under the opponent's rifle.

(2) *Cut-over*.—If the opponent's rifle is held low, bring your piece to the opposite side by passing it over his in the same manner as in (1) above.

(3) *Cross step*.—In charging in on an opponent, cross the rear foot over the leading one just before reaching effective range with the bayonet, thereby attacking him from one side or the other instead of directly from the front. This maneuver is similar to that of an open-field runner in football avoiding a tackler.

c. *Footwork*.—The men will be given practice in advancing and closing rapidly with an enemy, in moving quickly short distances to either side, and in dodging. However, the instructor must make certain that the instinct to close instantly with one's enemy is developed through these practices and that the bayonet fighter does not hold off and fence with his opponent.

28. Combat practice rushing.—a. Two men will place themselves 20 yards apart, each at the *guard* position. At a signal,

they charge each other. Men should never be allowed to fight for more than one clean hit in any assault, nor, failing to get a hit, to fight for more than 20 seconds.

b. All tendencies toward wildness will be rigorously checked. If, during the rushing, there appear any of the following faults, men will be taken out and practiced until they recover their form:

- (1) Flagrant loss of aim or balance.
- (2) Light tapping blows.
- (3) Useless parries or movements of the piece.
- (4) Slowing up just before the shock.

29. **Rushing in groups.**—*a.* One man will receive the assault of two or three others placed one behind the other at 10 to 15 paces distance.

b. One man will receive the converging assault of two others placed at 10 paces interval from each other.

c. These formations may be varied in any way that may appear valuable and instructive.

30. **Team fighting.**—After the men have attained proficiency in individual combat, squads or larger groups may oppose each other.

31. **Tournaments.**—No particular activity in a bayonet training course so arouses interest and enthusiasm in the work as a wooden rifle combat tournament. The champion of the squad, section, platoon, or group, is determined by the process of elimination, winners of individual bouts being paired against each other until but one winner remains. Such a competition should not be undertaken until the men have attained a reasonable degree of proficiency with the wooden rifle.

SECTION III

THE QUALIFICATION COURSE

32. **General.**—*a.* The object of the qualification course is to establish a standard performance which approaches, in its demands upon the soldier's speed, accuracy, strength, and endurance, the demands made by actual bayonet combat, and which will serve as a measure of proficiency in handling the rifle and bayonet.

b. In any assault the attackers are necessarily subjected to severe physical exertion as well as to great nervous tension,

while the defenders may be comparatively fresh. Therefore, quick aim and good direction with the bayonet, accurate and vigorous delivery of the thrust, and clean, quick withdrawals, are of the greatest importance.

c. Assault practice will not be undertaken until the men have completed the preparatory training outlined in Section II, which usually will require about 60 per cent of the period allotted to bayonet training.

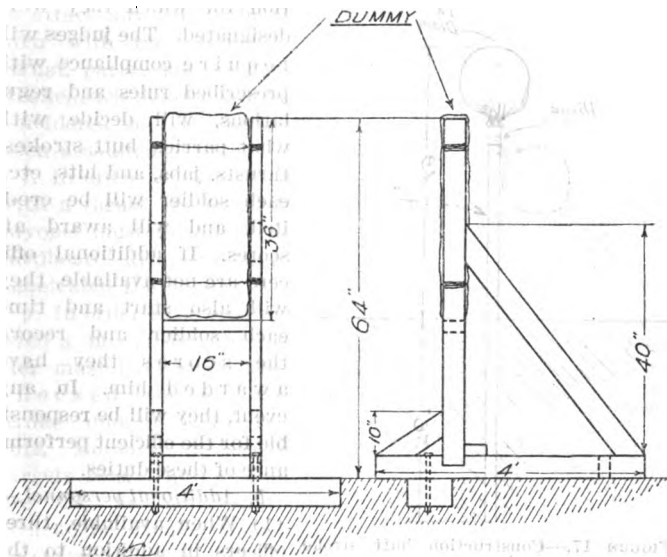


FIGURE 16.—Construction of thrust dummy

33. Description of the course.—a. The course consists of eight dummies representing targets for parries, thrusts, jabs, and butt strokes, and two "E" targets that represent a fleeing enemy. A cardboard disk six inches in diameter will be pasted on each dummy, except the butt stroke dummies (fig. 17) and the jab dummy (fig. 18), to serve as an aiming point for the thrust. On the dummy shown in Figure 19 which requires a parry prior to the thrust, the cardboard disk will be so located as to make the parry necessary in order to score a hit on the disk.

b. The construction of the dummies is explained in paragraph 41 and illustrated in the different figures. The arrangement of the qualification course is shown in Figure 20.

34. Personnel for operation of course.—*a. Judges.*—Each regimental or detached battalion commander will designate three officers who are not members of the company running the course, to act as judges for all organizations of the regi-

ment or battalion at the station for which they were designated. The judges will require compliance with prescribed rules and regulations, will decide with what parries, butt strokes, thrusts, jabs, and hits, etc., each soldier will be credited, and will award all scores. If additional officers are not available, they will also start and time each soldier and record the scores they have awarded him. In any event, they will be responsible for the efficient performance of these duties.

b. Additional personnel.—

(1) When available, three officers in addition to the judges, should be provided,

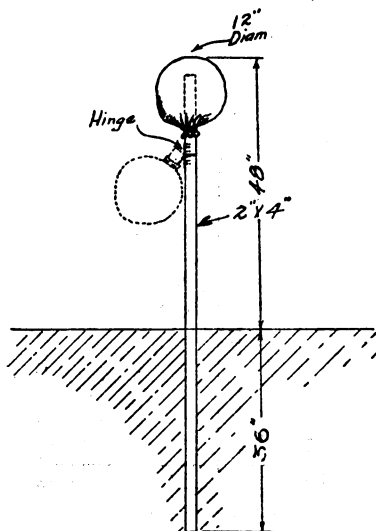


FIGURE 17.—Construction butt stroke dummy

one to be starter, another timer, and the remaining one, scorer.

(2) One noncommissioned officer will be detailed to take charge of the course, and he will be provided with such assistants as are required to renew and rearrange dummies and other materials.

35. Rules.—*a.* Each man who fails to qualify on his first attempt for record will be given a second trial. His score for record will be the highest one made in either of his two trials. No one will be allowed more than two trials in any practice season.

b. The thrust or butt stroke used in attacking each dummy on the course must be the one prescribed for that particular dummy.

c. Falling down or losing the rifle does not disqualify, provided a recovery is made and the course completed within the maximum time limit.

d. Scabbards are removed from bayonets.

e. If a man for any reason fails to make a bona fide effort to attack any dummy in its turn with the prescribed thrust, parry, jab, or butt stroke, such dummy will be considered as not having been assaulted.

f. In order to be credited with a thrust, the soldier's bayonet must have cut the cardboard disk and have penetrated the dummy.

g. In order to be credited with a butt stroke, the soldier must have completely knocked over the butt-stroke dummy with the butt. Moreover, in case of targets Nos. 1 and 7, Figure 20, he must have struck the dummy before he crossed the take-off line.

h. In order to be credited with a parry, the soldier must have executed the parry as prescribed in paragraph 17.

i. Only one thrust, jab, or butt stroke will be allowed in order to score a hit on any dummy.

j. A stop watch will be used to determine the time of running and the soldier will be credited to the nearest second.

k. The uniform will be the service uniform without hat or coat. No hobnails or spikes will be worn on shoes. The belt, cartridge, caliber .30, will be worn.

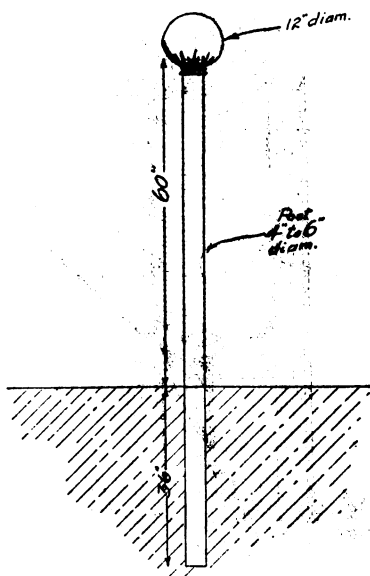


FIGURE 18.—Construction jab dummy

l. Prior to taking his place at the starting point, the soldier will place two blank cartridges in the magazine, and being careful to keep the chamber empty, will close the bolt and let the cocking piece move to its forward position. To insure safety, an officer will check this operation and thus assure himself that there is no blank cartridge in the chamber.

m. In order to be credited with firing at the "E" targets the soldier must reach the firing point before doing any firing,

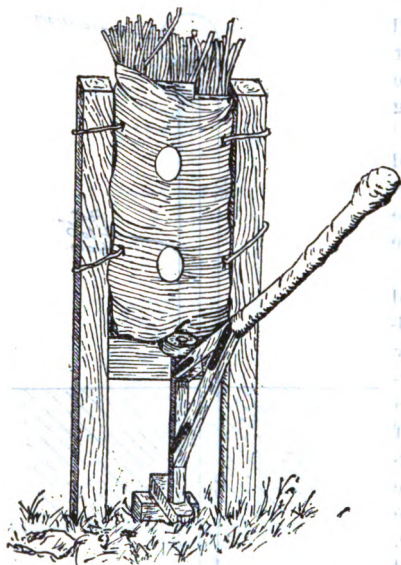


FIGURE 19.—Parry and thrust dummy

and no cartridge will be loaded into the chamber until after the soldier has arrived at that point. Credit will be given where he properly loads, aims, and fires regardless of whether the cartridge explodes, or, as may sometimes occur, where, in the operation of loading, one or both cartridges are by mishap ejected from the receiver.

n. The two "E" targets will be placed at a maximum distance of 100 yards from firing point. (Point "B," Fig. 20.) The exact distance to targets will depend upon local conditions.

36. **Manner of running the course.**—The soldier takes the prone position in rear of the starting point. At the command *up*, he springs to his feet and, with his piece at *high port*, runs toward the first dummy. He attacks each dummy in turn and then continues to the firing point where he assumes the standing position without sling and fires two aimed rounds (blank), one at each "E" target. Battle sight will be used.

37. **Time.**—The time limit for completing the course is 40 seconds. The time for each soldier running the course is taken from the command *up*.

38. Scoring.—a. If the soldier fails to assault any dummy, or to fire at least one aimed shot at the "E" targets, or consumes more than 40 seconds, he is given a score of zero for

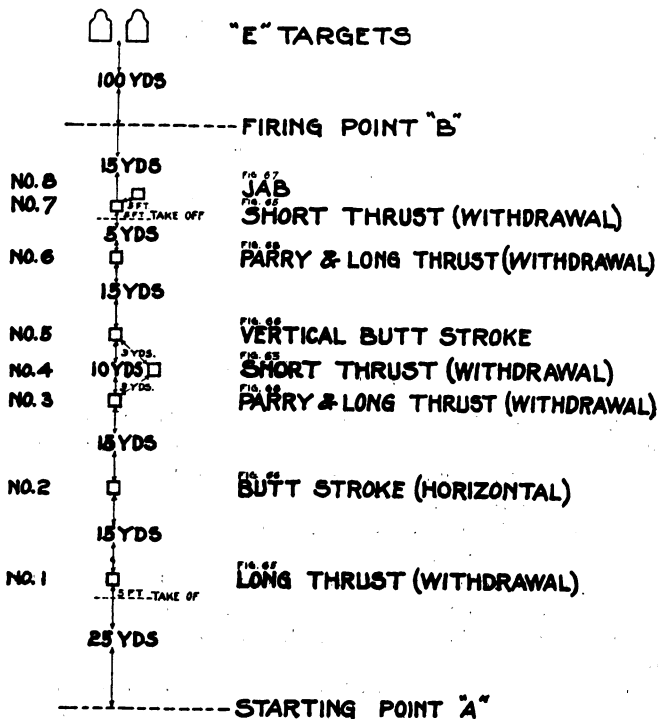


FIGURE 20.—Qualification course

the entire course for that trial. Nothing additional will be allowed for completing the course in less than 40 seconds.

b. If the soldier assaults each dummy, fires at least one aimed shot at the "E" targets, and completes the course within a maximum time limit of 40 seconds, he will be awarded for each parry, butt stroke, thrust and jab and for each shot fired at

the "E" targets, with which he is credited, the values shown in the following table:

Dummies and target	Points per parry	Points per butt stroke	Points per thrust	Points per jab	Points per shot (2)	Total maximum points
No. 1.....			6			6
No. 2.....		6				6
No. 3.....	2		6			8
No. 4.....			6			6
No. 5.....		6				6
No. 6.....	2		6			8
No. 7.....			6			6
No. 8.....				6		6
No. 9.....					4	8
Possible score with maximum time.....	4	12	30	6	8	60

SECTION IV

EQUIPMENT

39. Service rifle and bayonet.—Care will be taken that the object representing the enemy is incapable of injuring the bayonet or butt. Only light sticks will be used for parrying practice with the rifle. The front sight cover will not be removed during instruction with the bayonet.

40. Disks.—For obtaining accuracy in thrusts there must always be an aiming mark on the dummy. Cardboard disks, six inches in diameter, can be improvised for this purpose. By changing the position of the disk, the life of the dummy can be prolonged.

41. Dummies.—*a. Thrusting.*—Thrusting dummies can be made by pressing suitable materials, such as cane, or small brush, into a form 34 by 14 by 9 inches. This is bound together, heavy cardboard placed on one side, and the entire bundle then covered with burlap.

b. Butt stroke.—Butt-stroke dummies can be made by stuffing heavy cloth bags with some light material, such as straw or wood shavings.

c. Rough and tumble.—A dummy for practice in rough-and-tumble fighting can be easily made as shown in Figure 21. A stout stick about the length of the rifle and bayonet should be used in place of the rifle. All tricks of rough-and-tumble fighting can be used against this dummy.

42. Training sticks.—The training stick is a light stick the length of the rifle with bayonet fixed, padded lightly at one end and provided at the other end with a light rope or wire thrusting ring five inches in diameter.

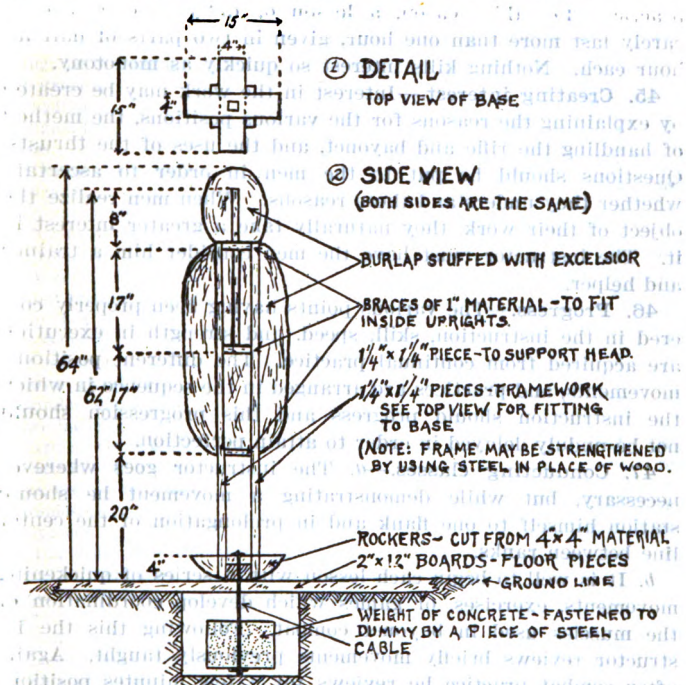


FIGURE 21.—Dummy for rough-and-tumble fighting

43. Combat equipment.—*a. Protective equipment.*—One set for each man.

b. Wooden rifle.—As issued.

SECTION V

ADVICE TO INSTRUCTORS

44. Length of lesson and practice.—As it is not the intention nor is it necessary to make the technique of bayonet fighting difficult, long detail is quite unnecessary and serves only

to make the work monotonous. All instruction must be carried out on common-sense lines. It should seldom be necessary to give a demonstration more than two or three times, after which the individual should acquire the correct position by practice. For this reason, a lesson or daily practice should rarely last more than one hour, given in two parts of half an hour each. Nothing kills interest so quickly as monotony.

45. Creating interest.—Interest in the work may be created by explaining the reasons for the various positions, the method of handling the rifle and bayonet, and the uses of the thrusts. Questions should be put to the men in order to ascertain whether they understand these reasons. When men realize the object of their work, they naturally take a greater interest in it. The instructor must have the men consider him a trainer and helper.

46. Progress.—The various points having been properly covered in the instruction, skill, speed, and strength in execution are acquired from continual practice. The different positions, movements, and practices are arranged in the sequence in which the instruction should progress and this progression should not be unduly delayed in order to attain perfection.

47. Conducting classes.—*a.* The instructor goes wherever necessary, but while demonstrating a movement he should station himself to one flank and in prolongation of the center line between ranks.

b. It is well to begin each lesson with a series of quickening movements, exercises, or games which develop coordination of the muscles used in bayonet combat. Following this the instructor reviews briefly movements previously taught. Again, after combat practice he reviews for a few minutes positions and movements and corrects faults induced by simulated individual fighting.

48. Size of class.—The maximum number of men to be trained by one instructor is 20. Better results will be obtained with a class of 10. Each man requires individual instruction and supervision, and with a large class this is impossible.

INDEX

	Paragraphs	Page
Boxing; use in training.....	1	2
Butt strokes:		
Position.....	20, 21	16, 17
Signal for.....	2	6
Classes:		
Conduct by instructor.....	47	30
Size of.....	48	30
Coach-and-pupil practice.....	2	4
Combat equipment:		
Protective.....	43	29
Wooden rifle.....	43	29
Combat practice rushing.....	28	21
Commands:		
Assemble.....	2	4
Formation.....	2	4
Cut-over, signal for.....	2	6
Cut-under, signal for.....	2	6
Disarming opponent:		
Armed with a knife.....	25	20
Armed with a rifle.....	24	20
Disks, use of improvised.....	40	28
Dummies, manufacture of.....	41	28
Equipment.....	39-43	28, 29
Fighting instinct, development of.....	1	1
Formation; command.....	2	4
Games, use in development of the individual.....	1	2
Guard:		
Common faults.....	4	7
Description of position.....	4	6
Short; position.....	5	7
Signal for.....	2	5
Hand-to-hand fighting.....	23	19
High port; position.....	7	8
Injuring opponent, methods of.....	19	16
Instruction, method of.....	2	3
Instructors, advice to.....	44-48	29, 30
Interest in work, how created.....	45	30
Jab, signal for.....	2	6
Jumping trenches; position.....	8	8
Lesson, length of.....	44	29
Long thrust; position.....	9-12	8-12
Parries:		
Position for.....	17	14
Signal for.....	2	6

	Paragraphs	Page
Practice, length of.....	44	29
Progress in instruction.....	46	30
Qualification course:		
Description.....	33	23
Manner of running.....	36	26
Object.....	32	22
Personnel.....	34	24
Rules.....	35	24
Scoring.....	38	27
Time.....	37	26
Rest; position.....	6	7
Rifle, service, care of.....	39	28
Rushing:		
Combat practice.....	28	21
Group.....	29	22
Scabbards not to be removed.....	2	3
Short guard; position.....	5	7
Short thrust; position.....	13-15	12-13
Signals, use in training.....	2	5
Spirit, development of.....	1	1
Team fighting.....	30	22
Thrust:		
Long, at changing targets; position.....	11	11
Long, at disks on dummies; position.....	12	11
Long; position.....	9-12	8-12
Long, withdrawal from; position.....	10	9
Short, at changing targets and at dummies; position.....	15	13
Short; position.....	13-15	12-13
Short, withdrawal from; position.....	14	12
Signal for.....	2	5
Tournaments.....	31	22
Training:		
Preparatory.....	3-31	6-22
Rules for.....	2	3
Training stick:		
Description.....	42	29
Obtaining good direction and quickness with.....	22	18
Parrying.....	19	15
Trenches, position in jumping.....	8	8
Vulnerable parts of the body.....	3	6
Wooden rifle combat:		
Success in.....	27	21
Training.....	26	20
Wrestling, use in training.....	1	2



N 3.63: 3 pt. 1/chap. 5

WAR DEPARTMENT

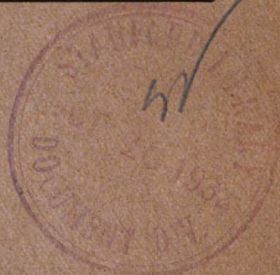
BASIC FIELD MANUAL



**Volume III
BASIC WEAPONS**

**PART ONE
RIFLE COMPANY**

**CHAPTER 5
INSTRUCTION WITH HAND AND RIFLE
GRENADES**



BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 5 INSTRUCTION WITH HAND AND RIFLE GRENADES

**PREPARED UNDER DIRECTION OF THE
CHIEF OF INFANTRY**



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932**

For sale by the Superintendent of Documents, Washington, D. C. - Price 5 cents

WAR DEPARTMENT,
WASHINGTON, *July 14, 1932.*

Chapter 5 (Instruction with hand and rifle grenades), Part One (Rifle Company), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (4-13-31).]

BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,
General,
Chief of Staff.

OFFICIAL:

C. H. BRIDGES,
Major General,
The Adjutant General.

II

LIST OF FIELD MANUALS

A MANUAL FOR COMMANDERS OF LARGE UNITS. (M. C. L. U.)

Vol. I. *Operations*.—A guide for commanders and staffs for tactical operations of large units.

II. *Administration*.—A guide for the administration of large units in a theater of operations.

STAFF OFFICERS' FIELD MANUAL. (S. O. F. M.)

Staff principles and functions applicable to the staffs of all units, together with pertinent reference data.

BASIC FIELD MANUALS. (B. F. M.)

Training, administrative, and reference data applicable to more than one arm, with special reference to the smaller units.

Vol. I. *Field Service Pocketbook*. (F. S. P.).—The individual.

II. *Infantry Drill Regulations*. (I. D. R.).—Drill, dismounted ceremonies, and inspections; the infantry pack, display of equipment, and tent drill.

III. *Basic Weapons*. (B. W.).—Marksmanship and mechanical training of the rifle, automatic rifle, pistol, machine gun, 37-mm gun, 3-inch trench mortar, bayonet, and grenade instruction. Technique of fire (37-mm gun, 3-inch trench mortar, and machine gun); musketry and combat practice of small units, instruments.

IV. *Signal Communication*. (S. C.).—Signal regulations and technical information needed by officers and enlisted men on signal-communication duty of arms other than the Signal Corps.

V. *Transport*. (T.).—Equitation, training remounts, use and care of animals and of animal-drawn, pack, motor, and tractor transport.

VI. *Administrative Regulations*. (A. R.) Army Regulations essential to small units.

VII. *Military Law*. (M. L.).—The Manual for Courts-Martial, including the Articles of War; the Rules of Land Warfare, including recent conventions relative to the sick and wounded of armies in the field and to prisoners of war; an epitome of the legal principles applicable to military forces when aiding the civil power.

VIII. *Operations of Combined Arms (Small Units)*. (O. C. A.).—The principles, doctrines, and methods governing the tactical employment of combined arms with reference to the small units.

FIELD MANUALS FOR THE ARMS

The manual for each arm contains, primarily, the principles, doctrines, and methods governing the employment of that arm and pertinent reference data.

Infantry Field Manual. (I. F. M.)

- Vol. I. *Units other than Tanks.*
II. *Tank Units.*

Cavalry Field Manual. (C. F. M.)**Field Artillery Field Manual. (F. A. F. M.)**

- Vol. I. *Organization and Drill.*
II. *Tactics and Technique.*

Coast Artillery Field Manual. (C. A. F. M.)

- Vol. I. *Harbor Defense, Railway and Tractor-drawn Units.*
II. *Antiaircraft Artillery Units.*

Air Corps Field Manual. (A. C. F. M.)**Engineer Field Manual. (E. F. M.)**

- Vol. I. *Engineer Troops.*
II. *Military Engineering.*

Signal Corps Field Manual. (S. C. F. M.)

- Vol. I. *Signal Corps Troops.*
II. *Signal Corps Operations.*

FOREWORD

Basic Field Manual, Volume III, will be published in six parts, as follows:

PART ONE. Rifle company. (Each chapter of Part One will be published as a separate pamphlet.)

Chapter 1. Rifle marksmanship.

2. Automatic rifle marksmanship.
3. Automatic pistol marksmanship.
4. Instruction with the bayonet.
5. Instruction with hand and rifle grenades.
6. Musketry.

PART TWO. Fire-control instruments.

Chapter 1. Machine-gun instruments.

2. 37-mm gun and 3-inch trench mortar instruments.
3. Care, repair, and adjustment of instruments.

PART THREE. Machine-gun company.

Chapter 1. Mechanical training with the machine gun.

2. Machine-gun marksmanship.
3. Technique of machine-gun fire.
4. Barrages and concentrations.

PART FOUR. Howitzer company.

Chapter 1. Mechanical training with the 37-mm gun and the 3-inch trench mortar.

2. 37-mm gun and the 3-inch trench mortar marksmanship.
3. Technique of the 37-mm gun and the 3-inch trench mortar fire.

PART FIVE. Combat practice firing.

Chapter 1. General.

2. Rifle company.
3. Machine-gun company.
4. Howitzer company.

PART SIX. Antiaircraft marksmanship—Infantry weapons. (Each chapter of Part Six will be published as a separate pamphlet.)

Chapter 1. General.

2. Rifle and automatic rifle.
3. Machine gun, caliber .30.

TABLE OF CONTENTS

SECTION		Paragraphs	Pages
I.	General-----	1-3	1-3
II.	Hand grenades-----	4-7	3-15
III.	Rifle grenades-----	8-12	15-21
IV.	Police of range and destruction of duds-----	13-15	21-24
V.	Grenade courts-----	16-25	24-31

VI

BASIC FIELD MANUAL

VOLUME III, BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 5

INSTRUCTION WITH HAND AND RIFLE GRENADES

SECTION I

GENERAL

1. Method of instruction.—The method of presenting instruction with hand and rifle grenades is as follows:

a. Explanation.—The instructor should assemble the entire class and explain the details of the instruction.

b. Demonstration.—Demonstration is made by the instructor or by a demonstration group under direction of the instructor. The demonstration may be carried on concurrently with the explanation where this is desirable.

c. Individual practice.—Individual practice is carried on by the pupils under supervision of their coaches. The class is divided into groups of two men each. One of the two men acts as a coach, the other acts as a pupil. During instruction a man is either coaching or being coached; he never works alone. Individuals change from coach to pupil and from pupil to coach at will, unless otherwise ordered.

d. Tests.—A system of scoring and grading proficiency in throwing hand grenades will be found in paragraph 24.

2. Grenade fillers.—The filler is that substance contained in the body of a grenade. It may be an explosive charge or a chemical agent.

a. Explosive charges.—Fragmentation grenades contain an explosive charge in order to produce the desired disruptive effect. Those used at the present time are—

(1) *Trinitrotoluene.*—This is commonly called TNT and is a standard high explosive for general military use. It is rather stable in character and is only readily exploded by means of detonation. It comes in granular form for use in grenades. For general use it comes in small blocks or sticks weighing about one-half pound. These blocks are used in destroying certain grenade duds and can be used in making improvised grenades.

(2) *E. C. blank fire powder.*—This explosive has been developed to take the place of TNT for future manufacture. It is not as powerful as TNT and is exploded by ignition rather than detonation. The advantages are that larger fragments are produced, grenades so loaded are not susceptible to mass detonation, and the grenade can be issued fuze and ready for use.

b. Chemical agents.—The chemical agents used as fillers for grenades may be classified as smoke and gas. Those used at the present time are—

(1) *Titanium tetrachloride (FM).*—This is a yellowish liquid with a slight acid odor. It produces a nontoxic smoke upon being exposed to the air. This chemical as used in grenades is suitable only for training purposes.

(2) *Chloracetophenone (CN).*—This is a lachrymatory gas or tear gas, as it is sometimes called. It produces a severe burning effect principally to the eyes, causing an involuntary weeping. The effect produced is of little value in combat but is an effective agent in riots, civil disorders, etc.

3. Grenade accessories.—*a. Time fuse.*—Time fuse, or safety fuse, is a cord containing a slow-burning powder train. The time fuse issued to the service is known commercially as Bickford fuse and burns at the approximate rate of 15 inches per minute. Time fuse should always be tested before using to determine its rate of burning. The time fuse in most of the grenade firing mechanisms is cut to burn for five seconds.

b. Detonators.—A detonator is a metal capsule filled with a detonating explosive such as fulminate of mercury. Commercial detonators come in 10 sizes, numbered 1 to 10. The higher numbered sizes are larger and contain increasing amounts of the detonating mixture. No. 6's and No. 8's are the ones used in grenades. Detonators are sensitive to heat, shock, and friction and should be carefully handled at all times.

c. Fuzes.—The fuze is the mechanism that fires the grenade. Fuzes are described in detail and their functioning explained in TR 1350-B and 1350-C. All grenade fuzes are time and automatic. Time means that the grenade is fired after a certain lapse of time and not on percussion. Automatic means that the fuze begins to function automatically as it leaves the hand or rifle, thus providing a safety factor by eliminating the necessity of starting the action of the mechanism before the grenade is on its way. As to their final action, fuzes for both hand and rifle grenades may be classified as detonating or igniting.

(1) *Detonating fuzes* are those that contain a detonator. The function of the detonator is either to set off the explosive charge or burst the container and liberate the filler.

(2) *Igniting fuzes* are those that have a metal cup containing a small quantity of black powder or a powder pellet that ignites the filler.

SECTION II

HAND GRENADES

4. *General description.*—The following table gives the essential descriptive information pertaining to the authorized hand grenades. A more detailed description is found in TR 1350-B.

114587°—32—2

Type	Fuze	Weight loaded	Filler	Body	Bursting radius	Maximum range	Marking and color	Use
Fragmentation hand grenade, Mk. II (new type). ¹	Igniting, M10.	Ounces 22	EC blank fire powder.	Cast-iron ser-rated.	Yards 30	Yards 50	Yellow-----	Casualty.
Fragmentation hand grenade, Mk. II (old type) ; (limited standard).	Detonating, M15.	22	TNT-----	-----do-----	30	50	do-----	Do.
Fragmentation hand grenade, Mk. II (practice type). ¹	Igniting, M10.	20	2 black powder pellets.	-----do-----	(*)	50	Blue-----	Practice.
Smoke hand grenade, FM, Mk. II (limited standard). ²	Detonating, M6.	17	Titanium tetrachloride.	Sheet steel, smooth.	10	50	FM gray yellow stripe.	Smoke and training.
Lachrymatory hand grenade, CN, Mk. V (limited standard).	Igniting, M7.	8.65	Chloracetophenone.	Sheet steel, 2 annular corrugations.	8	50	CN gray green stripe.	Blinding and harassing.
Practice hand grenade, Mk. II (old type) ; (limited standard).	Detonating, No. 6.	20	None-----	Cast-iron ser-rated.	(*)	50	Blue-----	Practice.

¹ Issued fuze and ready for use.

² Issued unfuzed but with the grenade body loaded with the filler. The fuze is issued separately and must be assembled to the grenade prior to use.

³ Does not burst.

⁴ Seldom bursts.

NOTE.—The dummy hand grenade, Mk. I, is an article of issue and is a simple cast-iron body of the same weight and shape as a fragmentation hand grenade. It is used for practice in throwing. Empty fragmentation hand grenades, Mk. II, without fuzes, are also used for this purpose.

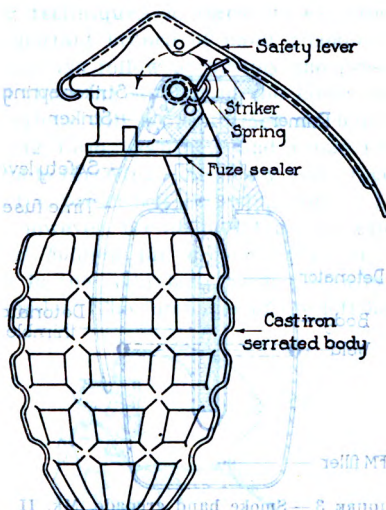


FIGURE 1.—Fragmentation hand grenade, Mk. II

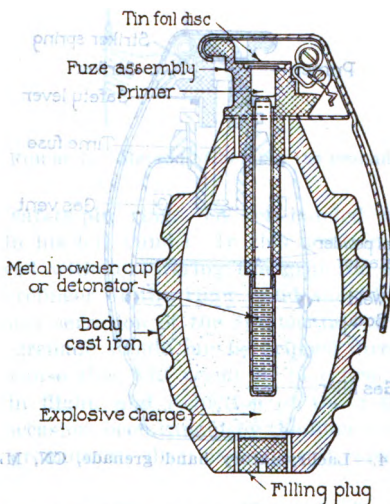


FIGURE 2.—Fragmentation hand grenade, Mk. II

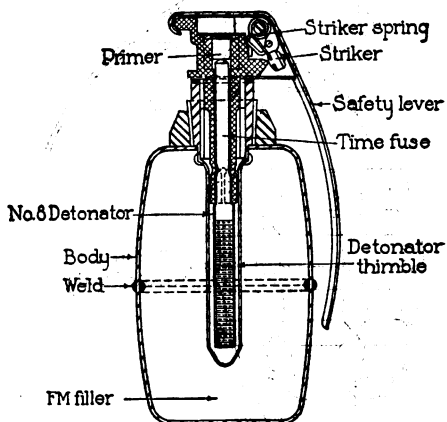


FIGURE 3.—Smoke hand grenade, Mk. II

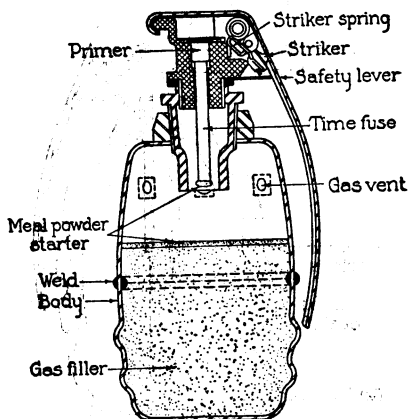


FIGURE 4.—Lachrymatory hand grenade, CN, Mk. V

5. Throwing technique.—*a. Importance.*—Grenade throwing is the most important branch of hand grenade training. The thrower must always follow accurately the prescribed method of arming and throwing so that in the latter stages of training these operations will be performed mechanically. Perfection of throwing form, accuracy, and range are the desired factors in grenade throwing. Accuracy and range are attained by practicing the prescribed throwing form. Due allowance may be made, however, for an individual's conformation.

b. Method of holding the grenade (fig. 5).—The grenade should be held in the right hand with the safety lever firmly pressed by the palm. The forefinger of the left hand is inserted

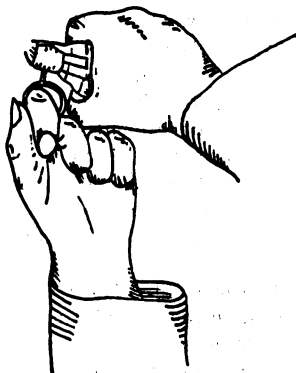


FIGURE 5.—Method of holding the grenade

through the safety-pin ring. (A left-handed man may hold the grenade in his left hand.) In this position the safety pin can be removed without altering the grip for throwing. The thumb and forefinger of the right hand should be around the upper horizontal serration of the fragmentation hand grenade, Mk. II. The grenade should not be gripped directly under the fuze head, because this will result in inaccuracy, tumbling of the grenade in flight, and reduction of the range. The fuze head has, on occasion, been caught by the fingers of the thrower, causing the grenade to drop immediately upon leaving the hand.

c. General rules for throwing.—The grenade is thrown by a combination of a shot put and baseball catcher's peg motion.

The biceps muscle of the throwing arm should be contracted just before throwing. The grenade is released just before the arm is fully extended. It is given a spinning motion by being released over the tips of the fingers as it leaves the hand so that it will rotate around its longer axis, fuze to the rear, during its flight to the target. The maximum range is obtained when the grenade leaves the hand, traveling at an upward angle of 45°. The hand being at the shoulder, to execute the throw, carry the right hand forward and upward without twisting the wrist. The left arm always counterbalances the movement of the right arm. If the grenades are striking to the right or left of the target the entire body should be shifted to the left or right. For the first practice no attempt should be made to throw over 20 yards, as the throwing arm might be injured. Thirty-five yards is considered a good range after the first 100 grenades have been thrown at an average rate of 30 or 40 grenades a day for three or more days. A 50-yard range is above average, but grenades have been thrown 70 yards. The range is measured from the left foot of the thrower to the point where the grenade first strikes the ground.

d. Throwing from the standing position (fig. 6).—The soldier or soldiers facing the target, the commands and manner of execution are as follows:

(1) *Stand*.—Face to the right. Move the left foot 1½ to 2 feet toward the target, with the toe pointing in the general direction of the target. Assume a well-balanced and easy position. With the hands down and in front of the center of the body, grasp the grenade in the prescribed manner. When dummy grenades are used the left forefinger grasps the right thumb to simulate the grasping of the safety-pin ring.

(2) *Pull pin*.—Pull out the safety pin with a twisting-pulling motion, holding the hands as nearly as practicable in front of the center of the body. When dummy grenades are used simulate this movement.

(3) *Prepare to throw*.—Quickly bring the right arm into position, the elbow at the height of and on line with the shoulders, palm of the hand up, and near or touching the shoulder. At the same time extend the left arm, palm of the hand down, in the direction of the target. The weight of the body is on the right foot. The body is bent to the right, right knee bent, eyes sighting over the left hand to insure direction and then fixed on the

target. If throwing from a trench or throwing pit, the eyes should be fixed on the parapet or top of pit.

(4) **Throw.**—Quickly move the right arm upward and to the front without twisting the wrist and release the grenade just before the arm is fully extended, being sure to impart a spinning motion. At the completion of the throw the left foot and right toe are on the ground.

(5) **Recover.**—Resume the position of **stand**.

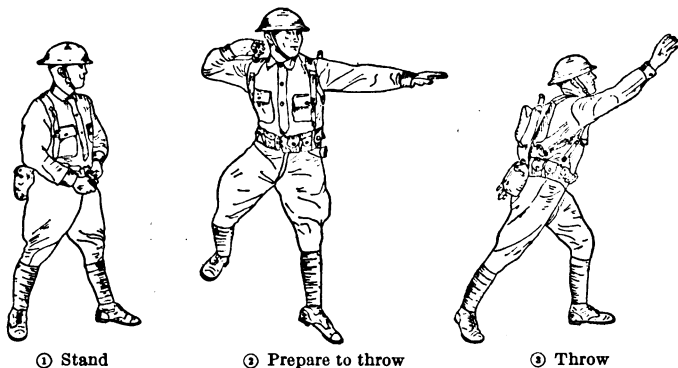


FIGURE 6.—Throwing from the standing position

e. Throwing from the kneeling position (fig. 7).—The soldier, or soldiers, facing the target, commands and manner of execution are as follows:

(1) **Kneel.**—Face to the right, kneel on the right knee, right leg directly to the rear, left leg and foot pointing in the general direction of the target. The weight of the body is on the right knee.

(2) **Pull pin.**—The execution is the same as for the standing position.

(3) **Prepare to throw.**—The execution is the same as for the standing position except the weight of the body is on the right knee.

(4) **Throw.**—The execution is the same as for the standing position except the body is brought to rest by the chest coming in contact with the left knee and upper leg at the completion of the throw.

(5) **Recover.**—Resume the position of **kneel**.

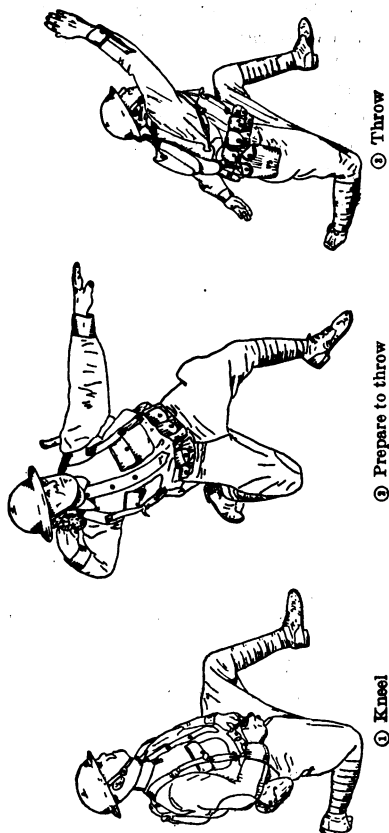


FIGURE 7.—Throwing from the kneeling position

f. Throwing from the prone position (fig. 8).—The soldier, or soldiers, facing the target, commands and manner of execution are as follows:

(1) *Lie down.*—Assume a prone position, as shown in Figure 8. The body is on a line approximately in prolongation of the target, so that when the position *prepare to throw* is taken it will be unnecessary to shift the feet or left knee. Either cheek is near or on the ground. Hold grenade as described in

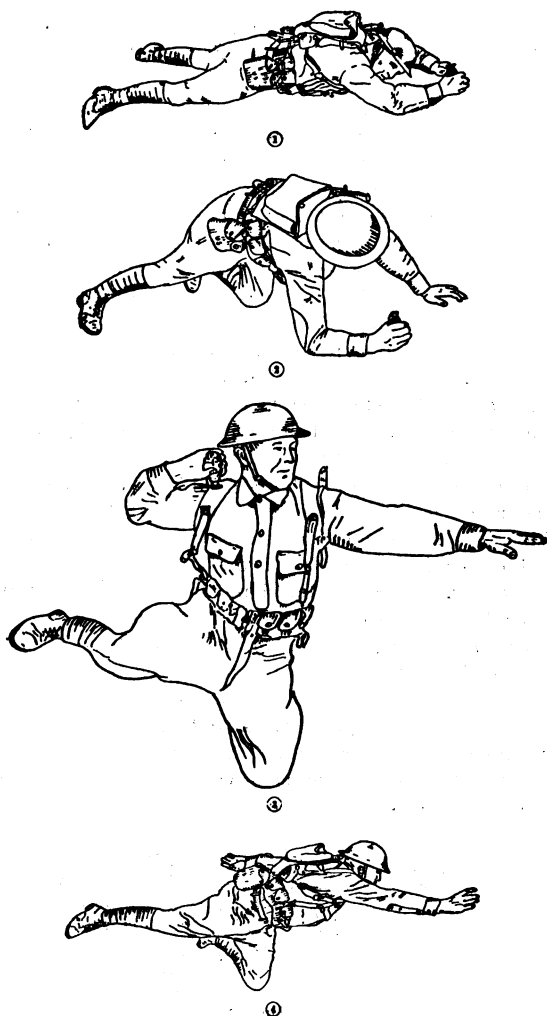


FIGURE 8.—Throwing from the prone position

114587°—32—3

b above and as shown in Figure 5, but in front of the head, as shown in Figure 8.

(2) **Pull pin.**—Hold the grenade in front of the head and pull pin in the same manner as described for the standing position.

(3) **Prepare to throw.**—Draw back the hands and arms so that the hands are near the shoulders, left hand and forearm flat on the ground, right forearm and wrist *only* on the ground; shove the body upward, pivoting the weight of body on left knee; straighten the right leg and extend it straight to the rear. Hold the body upright. Do not push up with the hand holding the grenade. Keep this hand clear of the ground, as shown in Figure 8. Continue until a kneeling position is assumed. Being now in a kneeling position, kneeling on the left knee, assume the same positions for the hands, arms, trunk, and eyes as given for the standing position.

(4) **Throw.**—The execution is the same as for the standing position. Stop the forward motion of the body by placing the right hand on the ground after the throw, permitting the body to continue to the ground. This position will leave the right hand near the head and the left hand near the waist on the left side. The left hand can be used to carry another grenade to the right hand for the next throw.

(5) **Recover.**—Place the left hand next to the right in front of the head. Resume the position of *lie down*.

g. Throwing prone, advancing (fig. 9).—The body of the thrower can be advanced about 2 feet at each throw if this is desired. The commands and movements are the same as for the prone position except in *prepare to throw*. As the hands are brought back advance the left knee as far as possible. The distance that the left knee is advanced is the distance that the body will be advanced for each throw.

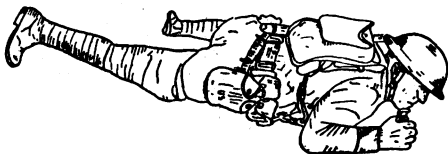


FIGURE 9.—Throwing from the prone position (advancing)

6. Fuzing.—The table given in paragraph 4 shows that certain grenades are issued unfuzed. This is because they have detonating fuzes and the detonation of one grenade will set off adjacent grenades. The grenade body in such cases has a wooden shipping plug screwed into the fuze seat.

a. Fragmentation hand grenade, Mk. II (old type).—Fuzing operations for this grenade are as follows:

(1) Unscrew and remove the wooden shipping plug.

(2) Examine the cavity left in the explosive by the plug. If the cavity is not clear or of sufficient size to receive the fuze without friction, use a wooden stick about one-quarter inch in diameter to enlarge the same.

(3) Insert the fuze into the grenade body.

(4) Hold the fuze in one hand and screw the grenade body onto the fuze with the other hand. In this operation the fuze should be the stationary part and the grenade body the moving part. A spanner wrench is packed in each box of detonating fuzes, and this should be used to firmly seat the fuze into the grenade.

b. Smoke hand grenade, Mk. II, FM.—The fuzing operations are the same as given in *a* above for the fragmentation hand grenade except that the cavity for receiving the fuze is already provided for in the detonator thimble. The thimble should, however, be examined for possible obstruction.

7. Safety precautions.—*a. General.*—(1) Do not subject fuze assemblies to heat, shock, or friction. By *heat* is meant such conditions as the direct rays of the sun when the temperature is 70° F. or more. By *shock* is meant such shock as is produced by carrying fuze assemblies loose in the pocket where the detonators strike against each other, dropping them from any height whatsoever, or striking a box of fuze assemblies with a hammer in order to open the box. By *friction* is meant any friction more than is met during the ordinary handling of the fuze assembly at the end away from the detonator. It is not necessary to touch the detonator of the fuze assembly. If at any time it is necessary to handle detonators alone, grasp the open end and not the closed end. If handled carefully detonators are not dangerous.

(2) At all times that method of safety insurance which insures the greatest safety to life and limb will be used by all concerned.

(3) If a grenade is dropped after the safety pin has been removed, or the striker has been allowed to function accidentally, the proper procedure is to immediately pick up the grenade, throw it as far as possible in the direction intended, and seek near-by shelter. If no shelter is near, drop flat on the ground, with the helmet toward the grenade. A grenade can be thrown farther than one can run in three or four seconds.

(4) The coach is responsible for his pupil and he should never quit his post and expose his pupil to danger.

(5) Do not pull out the safety pin until ready to throw.

(6) Do not release the safety lever before throwing.

(7) In case the safety pin will not pull out, do not straighten it until just before throwing the grenade. In the majority of grenades it will not be necessary to straighten the ends of the safety pins, as a twisting-pulling motion readily removes them.

(8) Do not recover a "dud," that is, a grenade that has failed to explode after throwing, until at least 10 minutes have elapsed. (Par. 13.)

(9) Do not take a "dud" apart.

(10) Do not take any grenade apart unless you have orders to do so.

b. Throwing live grenades.—The maximum number of men in any throwing group for live grenade throwing will be two—the coach and his pupil. They will both wear steel helmets.

c. Fragmentation grenades.—(1) When throwing live fragmentation grenades a steel helmet will be worn by each individual within a range of 250 yards, because fragments are often blown high and descend with sufficient velocity to cause severe wounds. Each group, consisting of the coach and his pupil, will be protected from the front and from adjacent groups or individuals by sandbag screens not less than 20 inches thick, or some equivalent protection. The object of this protection is to insure against injury to personnel either from the front or flanks. The most desirable form of protection is a traversed trench. The instructor assigns each coach and pupil group to a firing bay. The firing bay should be to the thrower's right. The thrower should place himself far enough from the wall of the trench so as not to strike the wall with either the hand or grenade when throwing. *When throwing keep the throwing hand below the level of the parapet. Do not expose that hand any more than you would expose any other part of the body.*

The coach places himself to the right of and about 3 or 4 feet from the thrower.

(2) The practice type of fragmentation grenade will be thrown for practice as provided below for chemical grenades.

d. Chemical grenades.—(1) When throwing chemical grenades the protection afforded by sandbag screens or traversed trenches is not necessary. However, when grenades with detonating fuses are thrown, each coach and pupil group should be separated from other individuals by at least 10 yards.

(2) When throwing lachrymatory grenades care should be taken that the wind is blowing in such a direction that it will not bring the gas back upon the thrower or other individuals.

SECTION III

RIFLE GRENADES

8. General description.—The following table gives the essential descriptive information pertaining to the authorized rifle grenades. A more detailed description is found in TR 1350-C.

Type	Fuze	Weight loaded	Filler	Body	Burst- ing radius	Maxi- mum range	Marking and color	Use
Smoke rifle grenade, FM, Mk. I : (limited standard). Lechrymatory rifle grenade, CN, Mk. II ¹ (limited standard).	Detonating M9. Igniting M9-----	Ounces 16 9.8	Titanium tet- rachloride. Chloracetophe- none.	Sheet steel, smooth. Sheet steel, 2 annular cor- rugations.	Yards 10 8	Yards 265 265	FM gray-- CN gray--	Smoke and training. Blinding and harassing.

¹ Issued fuze.

² Issued unfuzed but with the grenade body loaded with the filler. The fuze is issued separately and must be assembled to the grenade prior to use.

9. Firing technique.—*a.* The rifle is placed either in a mechanical support such as a firing rack or is supported by the soldier. If supported by the soldier he will be in either the kneeling or the prone position. If necessary, a hole should be made so that the butt of the rifle rests fully and firmly on the ground.

b. The firing order sequence in (1) to (6) below is followed. During the first stages of training the firer gives each command and then executes it. After the firer knows the sequence and

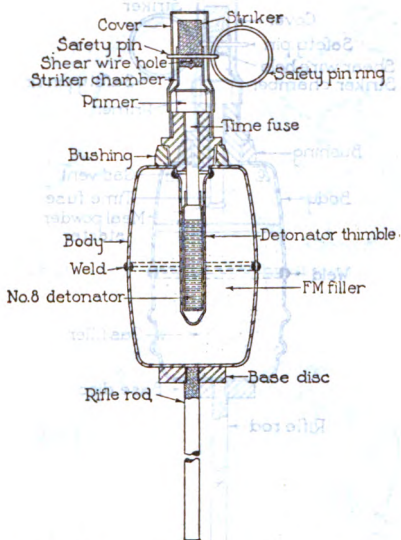


FIGURE 10.—Smoke rifle grenade, Mk. I

executes it properly he may eliminate the commands, but the sequence must be followed.

- (1) Open bolt.
- (2) Insert rod, and pull safety pin after insertion. (The rifle rod should slide freely into the bore. If not, the rod should be discarded and another used.)
- (3) Load. (At first use the rifle as a single loader. After practice and when several grenades are to be fired then load the magazine.)
- (4) Verify elevation. (See range table.)

(5) **Verify deflection.** (Select a reference point in line with the target so that subsequent corrections can be made.)

(6) **Fire.** (Lower the head so that it is below the muzzle of the rifle and squeeze the trigger without disturbing the elevation and deflection of the rifle.)

c. The coach may assist the firer by verifying the deflection and indicating subsequent corrections. For this purpose he takes a position to the rear of the firer.

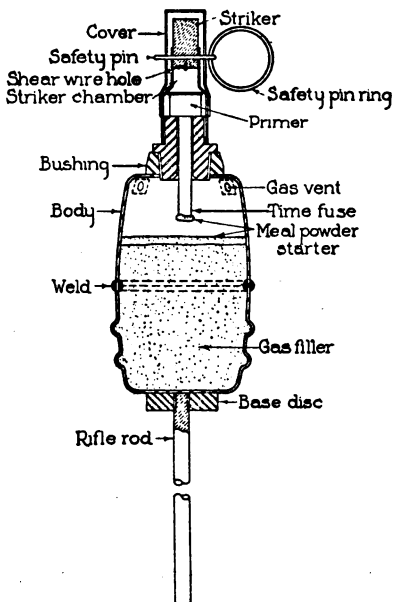


FIGURE 11.—Lachrymatory rifle grenade, CN, Mk. II

d. *Firing from the kneeling position* (fig. 12).—(1) Kneel on the right knee, left knee and left foot pointing toward the target, and brace the left side of the stock against the muscles of the right side of the right leg just above the knee.

(2) Support the left elbow on the left leg just above the knee and grasp the rifle with the left hand at some convenient place between the upper and lower bands.

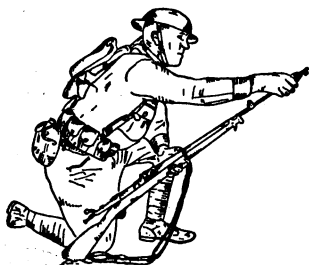
(3) Grasp the small of the stock with the right hand so that no part of the hand is nearer than 1 inch to the cocking piece.

(4) Incline the rifle at such an angle as to project the grenade the desired distance. (See range table.)

(5) Adjust the rifle so that the target and the axis of the rifle bore lie in the same vertical plane and then make allowance for wind by moving the muzzle to the right or left.



① Open bolt



② Insert grenade and pull pin



③ Load



④ Fire

FIGURE 12.—Firing from the kneeling position

e. Firing from the prone position (fig. 13).—(1) Assume the prone position, with the body inclined approximately 20° to the left and both elbows on the ground. Elevate the rifle, with the butt on the ground about 6 inches in front of the right shoulder.

(2) Grasp the small of the stock with the right hand so that no part of the hand is nearer than 1 inch to the cocking piece.

(3) With the left hand grasp the rifle at some convenient place between the lower band and the trigger guard.

(4) Incline the rifle at such an angle as to project the grenade the desired distance. (See range table.)

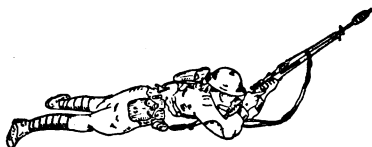
(5) Adjust the rifle so that the target and the axis of the rifle bore lie in the same vertical plane and then make allowance for wind by moving the muzzle to the right or left.



① Insert grenade and pull pin



② Load



③ Fire

FIGURE 13.—Firing from the prone position

10. Fuzing and assembly.—The first step in preparing rifle grenades for firing is to screw the rifle rod tightly into the base disk on the bottom of the grenade body. In case the grenade is one that is issued unfuzed, the next step is to remove the wooden shipping plug and insert the fuze in the same manner as prescribed in paragraph 6 for hand grenades.

11. Range table.—The following table gives the approximate ballistic data for all rifle grenades:

Elevation	Range	Time of flight
<i>Degrees</i>	<i>Yards</i>	<i>Seconds</i>
15	185	3.4
20	215	4.2
25	235	5.0
30	250	5.8
35	260	6.7
40	265	7.5
45	265	8.3

12. Safety precautions.—*a. Firing live grenades.*—(1) The maximum number of men in any firing group for live grenade firing will be two, the coach and his pupil. They will both wear steel helmets. When grenades with detonating fuzes are fired, each coach and pupil group will be separated from other individuals by at least 10 yards and the coach will take cover or move to a position behind the firer before such grenades are actually fired. Overhead firing, in time of peace, with any of the grenades is prohibited. Steps will be taken to see that the area to the front is cleared of personnel.

(2) All of the precautions given for the hand grenade under paragraph 7 apply to the rifle grenade, with a minor exception. The rifle grenade has no safety lever or striker spring and is not likely to function after the safety pin has been removed unless the striker is hammered or hits something with sufficient force to cut the shear wire.

(3) Additional precautions applicable to the rifle grenade have been indicated in the preceding paragraphs of this section. Only those who have been instructed in the provisions thereof will be permitted to fire rifle grenades.

b. Rifles.—United States rifles caliber .30 of Springfield Armory manufacture, having serial numbers 800000 or less, and rifles of Rock Island Arsenal manufacture having serial numbers 285507 or less, will, under no circumstances, be used for firing rifle grenades.

c. Cartridges.—The only cartridge authorized for firing rifle grenades is the chemical rifle grenade cartridge. They are packed in the same box with the rifle rods. The base of the cartridge is stamped with the letters "C. R. G." This cartridge has a propelling charge but no bullet. The use of service ammunition in firing rifle grenades will burst the barrel of the rifle, cause a premature explosion of the grenade, and result in serious accident.

SECTION IV

POLICE OF RANGE AND DESTRUCTION OF DUDS

13. Police of range after throwing live grenades.—*a.* After throwing or firing live grenades the range will be carefully policed under the direct supervision of a commissioned officer who is thoroughly familiar with the prescribed methods of destroying grenades, for the purpose of locating and destroying all grenade duds. The personnel engaged in this work must

be given instruction as to the exact procedure to be followed and made thoroughly familiar with the danger of handling or disturbing the duds.

b. All grenades are of the "time fuse" type—that is, they are designed to explode on the burning through of a piece of time fuse. This type of grenade dud can be safely picked up and destroyed at some central point, except that before picking up a fragmentation hand grenade the soldier should look at the striker and assure himself that it is all the way down against the primer. If the striker is not all the way down against the primer, but has only rotated part of the way, it is called a "hung striker." Such a grenade dud should not be picked up but should be destroyed where it lies. Other grenade duds with hung strikers can be picked up with safety because they can be thrown out of danger range in case the striker happens to function.

14. Method of destroying grenade duds.—a. Demolition with TNT blocks.—(1) High-explosive grenade duds can be most efficiently destroyed by means of $\frac{1}{2}$ pound blocks of TNT. When TNT blocks can not be obtained dynamite may be substituted.

(2) When it is considered safe to move them, not to exceed 30 or 40 grenades are stacked in a small hole dug in the ground about $1\frac{1}{2}$ feet or more in depth, care being taken that the bodies of the grenades are in close contact. For example, 40 grenades may be arranged by placing four side by side and four more base to base with those for the bottom layer, and putting four similar layers directly on top of this. A number of $\frac{1}{2}$ -pound TNT blocks are then placed on top of the grenades. The number of TNT blocks to be used will depend on the number of grenades to be destroyed at one time. One block is sufficient for 6 grenades piled in 3 layers of 2 grenades each. At least 2 blocks should be used on 12 grenades piled in 3 layers of 4 grenades each. Five or six blocks should be used to explode 30 or 40 grenades.

(3) Where as many as five or six TNT blocks are used, it is preferable to arrange these by placing four of them side by side on top of the grenades, in close contact, the remainder being placed on top of this layer.

(4) The desired length of time fuse is cut (time fuse should be tested to determine rate of burning). One end of the fuse is placed carefully in the open end of a No. 8 detonator until

it just touches the fulminate of mercury charge. Crimp the open end of the detonator tightly to the fuse by means of a fuse crimper, care being taken not to press the fuse tightly against the fulminate of mercury charge. (A cap should never be crimped to a piece of fuse with the teeth, as this is extremely dangerous.) The detonator is inserted into one of the topmost blocks of TNT.

(5) The grenades and TNT blocks are then covered by a mound of earth at least a foot deep, and tamped lightly in order to obtain the maximum efficiency from the TNT.

(6) With the grenades underneath the TNT charge, there is less scattering of fragments, and any grenades which happen to escape destruction will be left in the crater. These can then be destroyed by a second shot.

(7) When it is desired to destroy a fragmentation grenade dud where it lies, place one block of TNT so that it is touching the grenade, and explode the charge by means of a detonator and time fuse.

(8) The amount of earth covering used in the method described is entirely insufficient to prevent fragments of the grenades from being thrown to a considerable distance. It is not unusual for these grenade fragments to be thrown as far as 500 yards. All roads and other approaches to the range should be properly guarded, or red flags and warning notices posted. A safe shelter or bombproof, built of logs or other suitable material, must be erected on the range so that the personnel carrying out the work can take shelter when the blasts are fired. No blast will be fired without every precaution being taken to insure that no one is within range of fragments or likely to come within range before the charge explodes. This method is suitable for destroying high-explosive grenades only.

b. Demolition by means of fire.—Chemical grenades are more safely and efficiently destroyed by means of fire, as described below.

(1) A pit is dug in the ground about 2 feet square by 3 feet deep, and a loosely fitting cover of iron plate or heavy boards provided, which can be placed over the pit when necessary. A good fire of wood or coke is built in the bottom of the pit, and when a substantial bed of hot coals has been produced one of the grenades to be destroyed is dropped in, the cover quickly dropped in place, and the operator takes shelter *until*

the grenade has exploded. If there is unusual delay in exploding, no attempt should be made at that time to investigate. The time to investigate is after the fire has burned out and the pit is cold.

(2) Grenades should be put in the fire one at a time, so that there will be absolutely no doubt as to whether or not there is an unexploded grenade in the pit. Chemical grenades with detonating fuzes may explode with sufficient force to blow the cover off of the pit or to demolish it unless it is made of heavy material.

(3) This method is especially suitable for destroying grenades which contain no explosive charge except the detonator and which, therefore, are not easily disposed of by the use of TNT blocks. When burning lachrymatory grenades care should be taken that the wind is favorable and will not blow the gas in a direction to injure personnel. When these grenades are destroyed one at a time the tear gas is not effective at a greater distance than about 400 yards.

15. *Inspection of range after policing is completed.*—After the destruction of duds has been completed the officer in charge of the work will personally superintend a thorough police of the area in order to insure that no duds have been overlooked. This is essential, both for the protection of troops using the range at a future time, and to eliminate accidents to persons who might carry away duds as souvenirs.

SECTION V

GRENADÉ COURTS

16. *General plan.*—The plan of grenade courts covers practically all the throwing conditions that will be encountered in actual service. A definitely laid out system of courts is a necessity for training large classes where the time is limited and a fixed program must be followed. It eliminates indefinite procedure. With the exception of the trenches, or similarly constructed shelter, which must be had for live fragmentation grenade throwing, the remainder of the court may be laid out in a short time and with very little material. The thrower should be trained in all positions—standing, kneeling, and prone.

17. *The main court.*—*a.* Place five rows of lines as indicated in Figure 14, each row to consist of two lines of canvas or

target cloth placed 1 yard apart, indicating a trench. The strips of cloth should be about 2 inches wide. Each court should be 40 yards wide and 50 yards long. At one end construct four spider webs of cloth strips, each composed of three concentric circles, 1, 2, and 3 yards in diameter, respectively. Small stakes approximately 18 inches long, with pieces of cloth nailed on the top, are placed in the center of each web to give definite targets at which to aim.

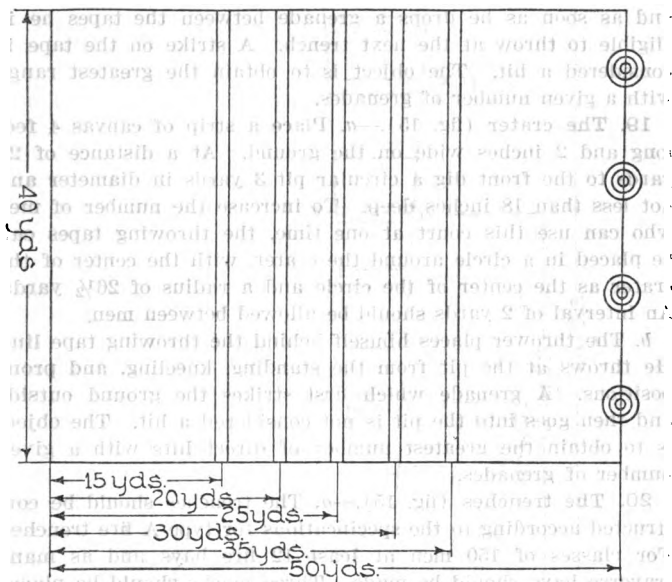


FIGURE 14.—The main court

b. This court will conveniently accommodate 64 men. Where a large class is to be instructed the spider webs should be eliminated and both ends of the court used, thus increasing the capacity to 128 men. During preliminary training in throwing, the men should not attempt to throw more than 35 yards, so there will be no danger of the two sections throwing into each other.

c. All preliminary dummy throwing should be conducted on the main court. Proficiency in form must be developed before advancing to the other courts. After suitable proficiency has

been attained in preliminary throwing work on the main court, advance the thrower to the angle court, crater, trenches, throwing pits, and vertical targets in order.

18. The angle court (fig. 15).—a. Construct the angle ACB by making the line AB 18 feet long and its center 50 yards from C . The taped or outlined trenches used as targets are 3 feet wide, with their centers 5 yards apart.

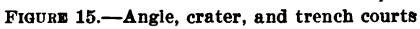
b. The thrower places himself with his advanced foot touching the line at C . He throws at the first trench in the angle, and as soon as he drops a grenade between the tapes he is eligible to throw at the next trench. A strike on the tape is considered a hit. The object is to obtain the greatest range with a given number of grenades.

19. The crater (fig. 15).—a. Place a strip of canvas 4 feet long and 2 inches wide on the ground. At a distance of 25 yards to the front dig a circular pit 3 yards in diameter and not less than 18 inches deep. To increase the number of men who can use this court at one time, the throwing tapes can be placed in a circle around the crater, with the center of the crater as the center of the circle and a radius of $26\frac{1}{2}$ yards. An interval of 2 yards should be allowed between men.

b. The thrower places himself behind the throwing tape line. He throws at the pit from the standing, kneeling, and prone positions. A grenade which first strikes the ground outside and then goes into the pit is not considered a hit. The object is to obtain the greatest number of direct hits with a given number of grenades.

20. The trenches (fig. 15).—a. The trenches should be constructed according to the specifications for type A fire trenches. For classes of 150 men at least 12 fire bays and as many traverse bays should be made. Three masks should be placed along the trenches about 10 yards in rear of the parados. These masks are sandbag walls 7 feet high, 12 feet long, and built on the circumference of a 12-foot circle. They are for the protection of the officers who have control of the firing line during live practice with fragmentation grenades.

b. For training other than live grenade practice the thrower places himself in a firing bay and throws at successive bays and traverses in turn until a hit is secured. The thrower can make observations for any and all throws by jumping up in the trench, but his hands must not touch any part of the



trench. The coach may place himself in such a position as to see the strike of the grenade, but in so doing should not expose his body unnecessarily. He should give the necessary corrections after each throw.

21. The throwing pits (fig. 16).—*a.* A pit 8 feet long, 4 feet wide, and 7 feet deep serves as a throwing trench. Along the longitudinal axis and at a distance of 25 yards dig a second pit 18 feet long, 2 feet wide, and 1 foot deep. At an angle of 45° to the right and left of the front edge of the throwing pit, and at a distance of 20 yards, dig a pit 18 feet long, 2 feet wide, and 1 foot deep, so that the longitudinal axis of each pit is perpendicular to the 45° line.

b. These pits are used for training in throwing from behind cover, from a trench, or where a quick glance or verbal direction must serve the thrower as a means of locating the target. For the first few throws the thrower is allowed to locate each pit before throwing by jumping up for one glance. He must not support himself by placing his hands on the sides of the trench. An assistant can call the correction after each throw as, "Up five right eight." The correction refers to yards. This serves as training in using the left arm for maintaining direction and gaging distance according to the effort of the throw. A grenade that first strikes the ground outside and then goes into a pit is not considered a hit. The object is to hit each of the three targets in turn with the least number of grenades.

22. The vertical targets (fig. 16).—*a.* The vertical targets consist of four targets. These targets represent windows at various heights from the ground. Each target has an interior dimension of 3 by 3 feet. Each target is constructed of two pieces 4 by 4 inches, used for uprights, and two crosspieces, 2 by 2 inches, placed on the uprights. From left to right, one target is level with the ground, one 6 feet above ground, one 12 feet above ground, and one 15 feet above ground. The height from the ground is measured from the ground to the interior edge of the bottom crosspiece of each target.

b. The thrower places himself with his advanced foot touching the throwing tape line. He endeavors to throw through the frames. A grenade which strikes the frame is not considered a hit. The object is to hit each of the four targets in turn with the least number of grenades.

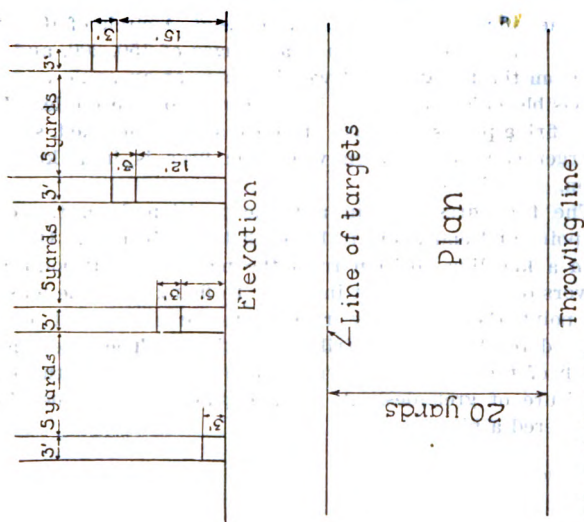
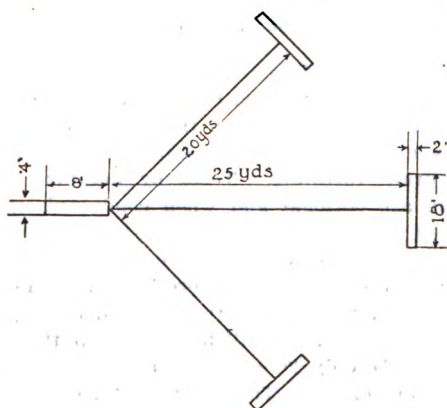


FIGURE 16.—Throwing pits and vertical targets



23. The rifle grenade court (fig. 17).—a. A circle of 10 yards radius is outlined on the ground at ranges of 150, 200, and 250 yards from the firing line. Two E targets at an angle or some other visible object is placed in the center of the circle. Two types of firing points are used, one open and one masked, so that the target can not be seen when the firer is in a kneeling position.

b. The firer fires first in a prone position from the open firing point and endeavors to hit each target in turn. He next fires in a kneeling position from the masked firing point and endeavors to hit each target in turn. In firing from the masked firing point the firer may rise to locate the target before firing and to observe the strike after firing. The object is to hit each of the targets in turn in each position with the least expenditure of grenades. A grenade placed within the circle is considered a hit.

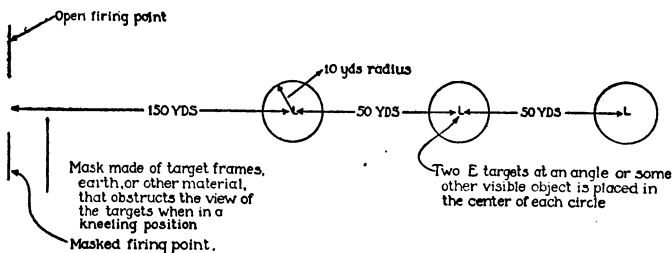


FIGURE 17.—Rifle grenade court

24. Scoring.—a. When local facilities permit the construction of grenade courts, and time is available for testing organizations in grenade throwing, the system explained in **b** below provides an effective means of stimulating interest and developing accurate throwers. Tests by organizations in grenade throwing are optional and when conducted necessary scoring sheets will be prepared locally.

b. All targets are required to be hit regardless of the number of grenades used. The best score is made by hitting all targets with the least number of grenades and thereby placing a premium on accuracy. It will be noted that there are 20 targets to be hit. If only 20 grenades are used the thrower has a perfect score of 100. The number of grenades used in excess of 20 reduces the score by a like amount.

25. Hand grenade score card.

(Name)

(Army Serial No.) (Grade, company, and regiment)

Courts	Procedure	Tar-gets to be hit	Num-ber of gre-nades used	Scor-er's in-itials
Main.....	Throws in any position at the first 4 trench lines in turn until a direct hit is made on the tape or in the trench.	4		
Angle.....	Throws in any position at the first 3 trench lines in turn until a direct hit is made on the tape or in the trench.	3		
Crater.....	Throws in each position—standing, kneeling, and prone—until a direct hit is made.	3		
Trenches.....	Throws in any position down the trench at the first 3 firing bays in turn until a direct hit is made.	3		
Throwing pits..	Throws in standing position at each target in turn until a direct hit is made.	3		
Vertical targets.	Throws in standing position at each window in turn until a clean hit is made.	4		
	Total.....	20		
	The score is obtained by deducting the number of grenades used from 120. Score.....			

Grading (circle the grade applicable):

Above 80..... Superior.
 Above 70..... Excellent.
 Above 60..... Satisfactory.
 Below 60..... Unsatisfactory.

Date.....

Certified correct.....

INDEX

Accessories:	Paragraph	Page
Detonators.....	3	3
Fuzes.....	3	3
Time fuse.....	3	2
Assembly of rifle grenades.....	10	20
Cartridges; safety precautions.....	12	21
Chemical grenades; safety precautions.....	7	15
Courts, grenade:		
Angle court.....	18	26
Crater.....	19	26
General plan.....	16	24
Main court.....	17	24
Rifle.....	23	30
Scoring.....	24	30
Throwing pits.....	21	28
Trenches.....	20	26
Vertical targets.....	22	28
Detonators.....	3	3
Duds; method of destroying.....	14	22
Fillers:		
Chemical agents—		
Chloracetophenone.....	2	2
Titanium tetrachloride.....	2	2
Explosive charges—		
E. C. blank fire powder.....	2	2
Trinitrotoluene (TNT).....	2	2
Firing technique:		
Assistance by coach.....	9	18
Firing order sequence.....	9	17
Kneeling position.....	9	18
Position of rifle.....	9	17
Prone position.....	9	19
Fragmentation grenades; safety precautions.....	7	14
Fuzes:		
Detonating.....	3	3
Igniting.....	3	3
Fuzing:		
Fragmentation hand grenade, Mk. II (old type).....	6	13
Rifle grenades.....	10	20
Smoke hand grenade, Mk. II, FM.....	6	13

	Paragraph	Page
Grenade duds; method of destroying.....	14	22
Hand grenades; description.....	4	3
Inspection of range after policing is completed.....	15	24
Instruction; method.....	1	1
Live grenades; safety precautions.....	7, 12	14, 21
Police of range after throwing live grenades.....	13	21
Range table; rifle grenades.....	11	20
Rifle grenades; description.....	8	15
Rifles; safety precautions.....	12	21
Safety precautions.....	7, 12	13, 21
Score card, hand grenade.....	25	31
Scoring.....	24	30
Targets, vertical.....	22	28
Throwing pits.....	21	28
Throwing technique:		
Importance.....	5	7
Kneeling position.....	5	9
Method of holding grenade.....	5	7
Prone, advancing.....	5	12
Prone, position.....	5	10
Rules for throwing.....	5	7
Standing position.....	5	8
Time fuse.....	2	2



W 3.63:3 pt. 1 / chap. 6

WAR DEPARTMENT

BASIC FIELD MANUAL



**Volume III
BASIC WEAPONS**

**PART ONE
RIFLE COMPANY**

**CHAPTER 6
MUSKETRY**



BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART ONE RIFLE COMPANY

CHAPTER 6 MUSKETRY

**PREPARED UNDER DIRECTION OF THE
CHIEF OF INFANTRY**

1931



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932**

**For sale by the Superintendent of Documents, Washington, D. C.
Price 10 cents**

WAR DEPARTMENT,
WASHINGTON, *March 1, 1932.*

Chapter 6 (Musketry), Part One (Rifle Company), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (4-13-31).]

BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,
General,
Chief of Staff.

OFFICIAL:

C. H. BRIDGES,
Major General,
The Adjutant General.

II

FOREWORD

Basic Field Manual, Volume III, Basic Weapons, will be published in six parts as follows:

PART ONE. Rifle company. (Each chapter of Part One will be published as a separate pamphlet.)

- Chapter 1. Rifle marksmanship.
- 2. Automatic rifle marksmanship.
- 3. Automatic pistol marksmanship.
- 4. Instruction with the bayonet.
- 5. Instruction with hand and rifle grenades.
- 6. Musketry.

PART TWO. Fire-control instruments.

- Chapter 1. Machine-gun instruments.
- 2. 37-mm. gun and 3-inch trench mortar instruments.
- 3. Care, repair, and adjustment of instruments.

PART THREE. Machine-gun company.

- Chapter 1. Mechanical training with the machine gun.
- 2. Machine-gun marksmanship.
- 3. Technique of machine-gun fire.
- 4. Barrages and concentrations.

PART FOUR. Howitzer company.

- Chapter 1. Mechanical training with the 37-mm. gun and the 3-inch trench mortar.
- 2. 37-mm. gun and the 3-inch trench mortar marksmanship.
- 3. Technique of the 37-mm. gun and the 3-inch trench mortar fire.

PART FIVE. Combat practice firing.

- Chapter 1. General.
- 2. Rifle company.
- 3. Machine-gun company.
- 4. Howitzer company.

PART SIX. Antiaircraft marksmanship—Infantry weapons.

- Chapter 1. General.
- 2. Rifle and automatic rifle.
- 3. Machine gun, caliber .30.

Digitized by Google

TABLE OF CONTENTS

	Paragraphs	Page
SECTION I. Introduction -----	1- 3	1
II. Range estimation -----	4- 5	3
III. Target designation -----	6- 8	6
IV. Rifle fire and its effect -----	9-15	12
V. Application of fire -----	16-21	16
VI. Landscape target firing -----	22-29	20
VII. Firing at field targets -----	30-39	30
VIII. Safety precautions and advice to in- structors -----	40-46	37

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 6

MUSKETRY

(The matter contained herein supersedes TR 145-5, December 12, 1923 (including C1, February 15, 1926; C2, January 3, 1927; and C3, January 3, 1929).)

SECTION I

INTRODUCTION

1. **General.**—*a.* Musketry is the application and control of the collective fire of rifle fire units.

b. Collective fire is the combined fire of a group of riflemen and automatic riflemen.

c. A fire unit is one whose fire in battle is under the immediate and effective control of its leader. The usual rifle fire units are the rifle squad and, at times, the rifle section.

d. In studying this chapter for use with cavalry units, the following substitutions should be made:

(1) For *section* substitute *cavalry platoon (dismounted)*.

(2) For *section leader* substitute *platoon leader*.

(3) For *section guide* substitute *platoon sergeant*.

(4) For *platoon* substitute *troop*.

(5) For *infantry soldier* substitute *dismounted cavalryman*.

e. The object of musketry training is to give the greatest possible effect to collective fire in battle.

f. Prior to musketry training the soldier should have received training in rifle marksmanship, automatic rifle marksmanship, extended-order drill, drill and combat signals, and certain elements of scouting and patrolling.

g. Musketry is confined to the mechanism of the application and control of collective fire, and precedes combat practice firing, in which subject it is combined with tactical exercises.

h. Training in musketry should begin soon after the completion of the marksmanship courses. For best results combat practice firing should closely follow musketry.

i. The units considered herein are the rifle squad and section. The weapons considered are the rifle and automatic rifle.

2. Importance of rifle fire.—Effective rifle fire is a characteristic of successful Infantry and an element which may determine the issue of battle. Collective fire is most effective when it is the product of teamwork. Rifle squads and sections must be trained to act as efficient and dependable teams in the delivery of collective fire.

3. Scheme of instruction.—*a.* From 35 to 70 hours is desirable for this training.

b. (1) This instruction is progressive and is divided into five consecutive steps. Each includes some, or all, of the methods previously learned. The steps are as follows:

1. Range estimation.
2. Target designation.
3. Rifle fire and its effect.
4. Landscape target firing.
5. Field firing.

(2) It is not essential that perfection be reached before proceeding to the next step; it is better that such a standard be attained by repetition, applying, in the steps that follow, everything that has already been learned. However, each step should be understood before proceeding to the next.

(3) The instructor thoroughly explains each step in detail. He then makes plain its relation to the subject as a whole. This is followed by a demonstration, which, in turn, is explained by the instructor. The troops then practice the principles and methods previously explained and demonstrated.

(4) Exercises pertaining to each step are hereinafter described in detail. They can be used for demonstrations and instructional practice. Some of them can be used to test fire units, thus introducing the desirable element of competition. These exercises may be changed to be made applicable to local conditions.

SECTION II

RANGE ESTIMATION

4. Importance.—In battle, ranges are seldom known in advance, so that the effectiveness of fire depends in large measure upon the accuracy of range estimation.

5. Methods.—Of the various methods of estimating ranges, only the following are considered in musketry training:

Estimation by eye.

Use of tracer bullets.

Observation of fire.

a. Estimation by eye.—(1) *Necessity for training.*—The usual method of estimating ranges in combat is estimation by eye. Since untrained men make an average error of 15 per cent of the range, when estimating by eye, and the effectiveness of rifle fire is largely dependent upon the accuracy of the estimation, training in this method is therefore very important.

(2) *Application of method.*—(a) The range is measured by applying to it a mental unit of measure 100 yards long. The same method is used as in measuring the length of a board with a ruler, except that the soldier's unit of measure is applied mentally. Thorough familiarity with the 100-yard unit, and with its appearance on varied terrain and at different distances, is necessary if the soldier is to apply it accurately.

(b) Application of the unit of measure beyond 500 yards is difficult. For such ranges a point is selected halfway to the target. The 100-yard unit of measure is then applied to the halfway point, and the result is multiplied by two.

(c) The average of a number of estimates by different men will generally be more accurate than a single estimate. This principle is used in musketry and in combat when time permits by taking the average of the estimates of the squad leaders, specially trained estimators, or the members of a squad.

(3) *Conditions affecting appearance of objects.*—(a) In some cases much of the ground between the observer and the target will be hidden from view, and the application of the unit of measure will be impossible. In such cases the range is estimated by the appearance of objects.

(b) Whenever the appearance of objects is used as a basis for range estimation, the observer must make allowance for the effects noted below:

1. Objects seem nearer—

- (a) When the object is in a bright light.
- (b) When the color of the object contrasts sharply with the color of the background.
- (c) When looking over water, snow, or a uniform surface, like a wheat field.
- (d) When looking from a height downward.
- (e) In the clear atmosphere of high altitudes.
- (f) When looking over a depression most of which is hidden.

2. Objects seem more distant—

- (a) When looking over a depression most of which is visible.
- (b) When there is a poor light or fog.
- (c) When only a small part of the object can be seen.
- (d) When looking from low ground upward toward higher ground.

(4) *Exercises.*—(a) *Exercise No. 1.*

1. *Purpose.*—To familiarize the student with the unit of measure, 100 yards.

2. *Method.*—The unit of measure, 100 yards, is previously staked out over varied ground, using markers that will be visible up to 500 yards. The men are required to become thoroughly familiar with the appearance of the unit of measure from the prone, kneeling, and standing positions at various ranges. They do this by moving away from and in prolongation of the lines staked out and studying the appearance of the unit from distances of 100, 200, 300, and 400 yards.

(b) *Exercise No. 2.*

1. *Purpose.*—To illustrate the application of the unit of measure.

2. *Method.*—Ranges up to 900 yards are measured accurately and marked at every 100 yards by large markers or target frames, each bearing a number to indicate its range. Men undergoing instruction

are then placed about 25 yards to one side of the prolonged line of markers and directed to place a card, hat, or some other object before their eyes so as to cover from view all of the markers. They are then directed to apply the unit of measure five times along a straight line in the general direction but slightly to one side of the markers. When they have selected the final point reached by mentally applying the unit to the ground five times, the eye cover is removed and the estimations of the successive 100-yard points and the final point are checked against the markers. Accuracy is gained by repeating the exercise.

3. Ranges greater than 500 yards are then considered. With the markers concealed from view in the same manner as explained in 2 above, men estimate the ranges to points which are obviously over 500 yards distant and a little to one side of the line of markers. As soon as they have announced each range they remove their eye covers and check the range to the target and to the halfway point by means of the markers. Prone, sitting, or kneeling, and standing positions are used during this exercise.

(c) *Exercise No. 3.*

1. *Purpose.*—To give practice in range estimation.
2. *Method.*—From a suitable point ranges are previously measured to objects within 1,000 yards. The instructor conducts the class to the point where the men are required to estimate the ranges to the various objects that are pointed out by the instructor, writing their estimates upon paper previously issued. At least one half of the estimates are made from the prone or sitting positions. Thirty seconds are allowed for each estimate. When all ranges have been estimated the papers are collected and the true ranges announced to the class. Individual estimates and squad averages are posted on bulletin boards accessible to all members of the class.

b. *Use of tracer bullets.*—(1) When the range to a target is being estimated by use of tracer bullets, the scout, or leader, first estimates the range by eye, fires a tracer bullet, and then

corrects the sight-setting according to the strike of the bullet. The firing and correcting of the sight-setting are continued until a tracer appears to strike the target.

(2) The range thus determined must be corrected for the difference between the trajectory of the tracer bullet and that of the solid bullet. When using M1906 ball ammunition and M1917 or M1918 tracer ammunition, there is no difference up to 300 yards of range. If the range is 300 yards, or more, the correct sight-setting for the ball ammunition is obtained by deducting 50 yards from the sight-setting used for tracer bullets. No deductions are made for any range when using the M1 (boat-tailed) ball ammunition and the M1928, or later model, tracer.

c. Observation of fire.—Observation of fire can be used when the ground is dry, so that the dust kicked up by the bullets is visible. The same care is necessary as in determining the range by tracer bullets. The puffs of dust will appear slightly above the point struck by the bullet and on the side toward which the wind is blowing.

SECTION III

TARGET DESIGNATION

6. Importance and methods.—*a. Importance.*—Knowledge of how to designate a target is a vital element of musketry. Battlefield targets are generally indistinct; unless their position and extent are shown to the troops, the fire will have little or no effect.

b. Terms.—A knowledge of the following terrain features is an essential of target designation: Saddle, crest, military crest, bluff, fill, crossroads, road fork, road junction, road center, draw, ravine, and skyline. These terms are defined in the Infantry Field Manual, Volume I.

7. Methods.—The following methods are used to designate targets:

Tracer bullets.

Pointing.

Oral description.

a. Tracer bullets.—(1) Tracer bullets are the quickest, surest, and simplest means of designating a target. Their use, however, has limitations, for they may disclose our position to the

enemy, and the effect of a sudden burst of fire is lessened by preceding it with tracers.

(2) To designate a point target, the scout, or leader, announces "Range 500, watch my tracers," then fires a tracer at the target. If the target has width, the flanks are indicated by tracer bullets and announced as "Left flank" and "Right flank."

b. Pointing.—Targets may be pointed out either with the arm or rifle. Pointing may be supplemented by oral description. To use the rifle for this purpose, it is canted to the right and aimed at the target. The head is then straightened up without moving the rifle. A soldier standing behind can look over the shoulder through or over the rear sight and pick up the target. If time permits, a bayonet may be stuck into the ground, at an angle of about 45°, and the rifle rested on the hilt of the bayonet and pointed at the target.

c. Oral description.—(1) *Use.*—Oral description is often used by section and squad leaders to designate targets to their fire units. The section leader can seldom designate the target to his entire section. Pointing is generally used in combination with oral description.

(2) *Relation to fire orders.*—Oral description may be a part of a fire order, but such orders do not always contain a description of the target. "Fire at will" may be the best order for a particular situation. Generally, however, a fire order will contain a description of the target; as *Range 450, at base of lone pine tree* (pointing), *sniper fire at will*. Everything except "fire at will" is a description of the target.

(3) *Elements.*—(a) The elements of oral target designation are—

1. Range.
2. Direction.
3. Nature of target.

(b) These elements are always given in the sequence noted above. When the range is announced, the men set their sights before looking at the target. There is, however, one, and only one, exception to this rule. When the target is expected to be visible for a very short time, it is pointed out before it disappears.

(4) *Simple description.*—When the target is easily visible, simple description is used; for example, *Range 400, to your*

front, group of enemy. It will be noted that the range, the direction, and the nature of the target are all covered in correct sequence in this designation.

(5) *Reference point.*—(a) When the target is not easily visible and is not located at some prominent point, the direction to the target is indicated by a reference point. This is a point, preferably a prominent one, with reference to which the location of other points may be determined. Prominent objects are selected for the purpose, where possible, and care is taken that another similar object is not mistaken for the one intended. A reference point on a line with the target, and beyond it, will give greater accuracy than one between the observer and the target.

(b) When the reference point is on line with the target, the description will be as follows:

Range: 450.

Reference: Church spire.

Target: Machine gun in edge of woods. (Fig. 1, target at F.) In this case the target is 450 yards from the observer, and on a line with, but not at, the reference point. If there is no suitable reference point on a line with the target, one is selected elsewhere. If it is to the right or left of the target, the distance from the target must be determined.

(6) *Sights.*—(a) The difference in direction between the reference point and the target is measured in units called "sights." Assume that the rifle is pointed in the direction of the reference point and that it is found that when the left edge of the raised sight leaf is in line with the reference point, the right edge of the sight leaf will be in line with the target. Then the target is one sight width to the right of the reference point, and it is announced as "Right one sight." If the sight leaf can be applied one and one-half times in the above manner, the target is "Right one and one-half sights," and so on.

(b) For uniformity the rifle is held so that the sight leaf, when raised, will be about 14 inches from the eye. This position makes the sight a unit of angular measurement equal to 50 mils.

(c) Finger widths may be used in a manner similar to that of measuring with the rifle sight although this method is less accurate (Ex. No. 5). However measured, the unit of 50 mils is called a sight in musketry.

(d) Oral description by use of a reference point not on a line with the target is illustrated in the following manner (Fig. 1, target at H) :

Range: 600.

Reference: Church spire, right two sights.

Target: Group of enemy near crest.

(e) The width or extent of targets is also measured in "sights." (Fig. 1, target on line I-K.)

Range: 400.

Reference: Church spire, left two sights.

Target: Edge of woods extending left two sights. Enemy groups.

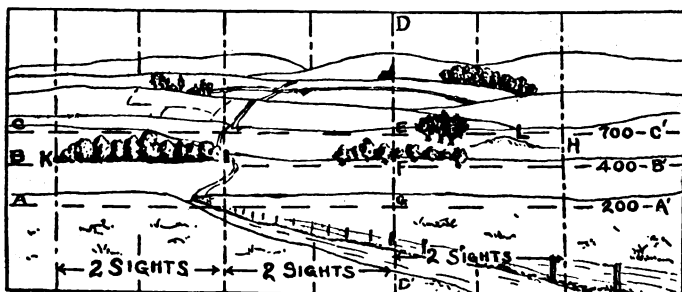


FIGURE 1.—Sight measurements in target designation

(7) *Successive reference points.*—(a) Successive reference points may be used instead of sight measurements (as described above) from one reference point. (Fig. 1, target at L.)

Range: 600.

Reference: Church spire; to the right and at a shorter range, group of three trees; to the right and at the same range.

Target: Machine gun at right end of mound of earth.

(b) A combination of sight measurement and successive reference points may also be used.

(8) *Variations.*—The simplest type of oral description which will fit the conditions will be the most effective. If one end of the target is considerably nearer than the other, the average range is announced. Dispersion will cover the target. Informal or conversational description is used to supplement the formal description when the target is not recognized from the formal

description alone. The latter, however, is usually effective, and will be given first.

d. Which method to use.—Troops will be trained in all the methods of target designation explained above. When methods are equally effective, the simplest will be used.

8. Exercises—*a. Exercise No. 4*—(1) *Purpose.*—Practice in target designation by means of tracer bullets.

(2) *Method.*—(a) On a class A or class B range a concealed target representing a machine gun is placed near a pit or other bullet-proof shelter. About 500 yards in front of the target a firing position suitable for a section is selected. The position of the target will be visible from the firing position, but the target itself may be invisible, due to its concealment. This concealment should have a natural appearance in order not to attract attention.

(b) The section is deployed along the firing position facing toward the target, and all except the scouts are then faced to the rear.

(c) The scouts take the prone position and are told that the waving of a red flag to their front will represent the firing and smoke from the machine gun.

(d) A man stationed in the pit waves a flag exactly in front of the target for 60 seconds and retires to the protection of the pit.

(e) The section is faced to the front and men take the prone position. Rifles are loaded, the scouts using tracer ammunition and the remainder of the section ball cartridges.

(f) The scouts point out the target by firing tracers and announce the range, which is passed along from man to man.

(g) As soon as each man understands the location of the target he opens fire with the proper sight setting.

(h) The instructor causes firing to cease shortly after all the men are firing.

(i) Noncommissioned officers do not participate in the fire. Squad leaders remain behind their squads and observe the conduct of their men. They move about freely. The section leader and section guide assist the instructor.

(j) After firing ceases, sight settings are checked by squad leaders and the target is examined or hits signaled to the section.

b. Exercise No. 5—(1) Purpose.—To teach use of sights and fingers for lateral measurement.

(2) *Method.*—(a) A number of short vertical lines 1 foot apart are plainly marked on a wall or other vertical surface. At a distance of 20 feet from the wall a testing line is drawn or marked out by stakes.

(b) The instructor explains that the vertical lines are one sight apart when measured from the testing line, so that the correct distance from the rifle sight leaf to the eye can be determined by pointing the rifle at the vertical lines and moving the eye along the stock until the raised sight leaf exactly covers the space between one of the vertical lines and the next line to the right or left. The instructor demonstrates with a rifle while explaining.

(c) The men take positions on the testing line and each determines the proper distance of his eye from the sight as explained by the instructor. The position of the eye with reference to the stock is carefully noted or marked on the stock.

(d) The instructor then explains and demonstrates the use of fingers in measuring sights. First he holds his hand, with palm to rear and fingers pointing upward, at such distance from his eye that each finger will measure one sight on the wall. Then, so that he can later redetermine this distance, he lowers his hand to his side without changing the angle of wrist or elbow and notes the exact point at which the hand strikes the body. Thereafter when measuring with the fingers he first places his hand at this predetermined point and raises his arm to the front without changing the angle of wrist or elbow. His hand will then be in the correct position for measuring sights by fingers.

(e) The men determine the proper distance of fingers from the eye as explained by the instructor.

(f) Practice in lateral measurement is given, using convenient objects within view and using both sights and fingers.

c. Exercise No. 6—(1) Purpose.—Practice in target designation by pointing with the rifle.

(2) *Method.*—(a) The squad, with the exception of the squad leader, is formed faced to the rear. The instructor then points out the target to the squad leader, who takes the kneel-

ing or prone position, estimates the range, adjusts his sight, aligns his sights on the target, and then calls, "Ready."

(b) The members of the squad then move in turn to a position directly behind the squad leader and look through the sights until they have located the target. The range is given orally by the squad leader to each individual. If the target has width, the squad leader, after giving range, announces so many sights right or left.

(c) As soon as each man has located the target he moves to the right or left of the squad leader, sets his sight, places his rifle on the bayonet rest or sandbag and aligns his sights on the target.

(d) The instructor, assisted by the squad leader, verifies the sight setting and the alignment of the sights of each rifle.

d. Exercise No. 7—(1) Purpose.—Practice in target designation by oral description.

(2) *Method.*—(a) The squad is deployed faced to the rear. The squad leader is at the firing point, where sandbags or bayonet rests have been provided for seven rifles.

(b) At a prearranged signal the target is indicated by the display of a flag. When the squad leader states that he understands the position of the target the flag is withdrawn.

(c) The squad is then brought to the firing point, placed in the prone position and each man required to set his sight, using the sandbag or bayonet rest to sight his rifle on the target according to the oral description of the squad leader. The squad leader gives his target designation from the prone position.

(d) The squad leader's designation is checked from the ground. The men are required to leave their rifles, properly pointed, on the rests until checked by the instructor or squad leader.

SECTION IV

RIFLE FIRE AND ITS EFFECT

9. Trajectory.—*a. Nature.*—The trajectory is the path followed by a bullet in its flight through the air; it is the same for the automatic rifle as for the rifle. The bullet leaves the rifle at a speed of 2,700 feet per second. Because of this great speed the trajectory at short ranges is nearly straight or flat.

NOTE.—All references in this section to the ballistic qualities of rifle bullets apply only to the M1906 ball ammunition.

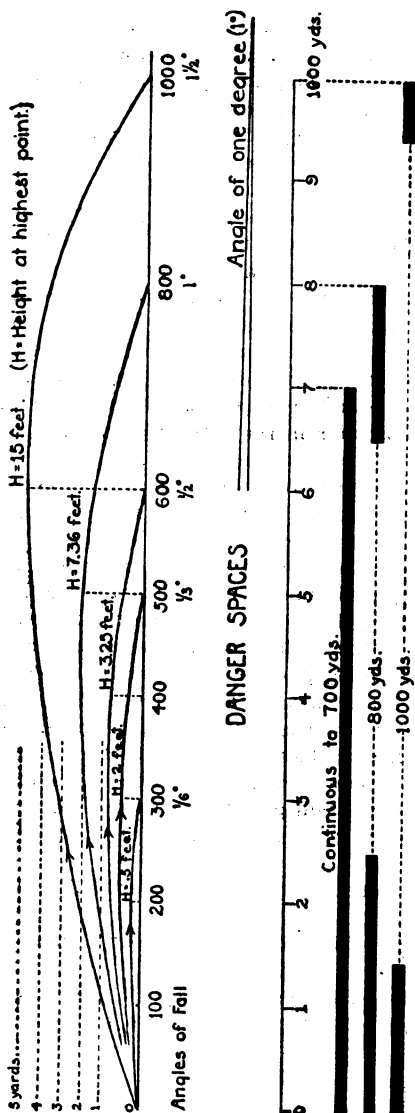


FIGURE 2.—Trajectory diagram (vertical scale is 20 times horizontal scale)

b. Danger space.—The danger space consists of two parts; from the rifle to the point at which the bullet rises above the height of a man standing and the space from the point where it again falls to the height of a man to the target. The trajectory for a range of 700 yards does not rise above the height of a man standing. Therefore, it is said that the danger space for that range is continuous between the muzzle of the gun and the target. For ranges greater than 700 yards, the bullet rises above the height of a man standing, so that only parts of the space between the gun and the target are danger spaces.

10. *Dispersion.*—Due to differences in ammunition, aiming, holding, and wind effects, a number of bullets fired from one rifle will not all follow in one path but will scatter or disperse slightly. The trajectories of those bullets therefore form an imaginary cone-shaped figure called the cone of dispersion. Dispersion is greater in the case of group firing because there are more variations to cause it.

11. *Shot groups.*—When the cone of dispersion strikes a vertical target it makes a pattern on it that is called a vertical shot group. Shot groups made on horizontal targets or surfaces are called horizontal shot groups. Due to the flatness of trajectory, horizontal shot groups have a length of from 100 to 400 yards, depending chiefly on the range.

12. *Beaten zone.*—The beaten zone is the ground struck by the bullets forming a cone of dispersion. When the ground is level, the beaten zone is also a horizontal shot group. The slope of the ground has great effect on the shape and size of the beaten zone. Rising ground shortens the beaten zone. Ground that slopes downward and in the approximate curve of the trajectories will greatly lengthen the beaten zone. Falling ground with greater slope than the trajectory will escape fire.

13. *Classes of fire*—*a.* Fire, as regards direction, is classified in musketry as follows:

(1) *Frontal.*—Fire delivered at right angles to the front of the enemy.

(2) *Oblique.*—Fire delivered at an objective from any direction other than that perpendicular to or parallel to either of its axes.

(3) *Enfilade*.—Fire delivered at an objective from on or near the prolongation of its longer axis. For example, fire delivered from a point on or near the prolongation of the enemy's line.

(4) *Flanking*.—Fire received by an objective from the direction of its flank.

b. Fire, as regards trajectory, is classified as follows:

(1) *Grazing*.—Fire approximately parallel to the ground surface, and close enough thereto to strike an object of a given height. The height of a man standing is usually taken as the determining factor.

(2) *Plunging*.—Fire which strikes the ground or other material object at a considerable angle.

(3) *Overhead*.—Fire delivered over the heads of friendly troops.

c. *Comparison*.—Oblique fire is slightly more effective than frontal. Enfilade and flanking fire are more effective than oblique. Grazing fire is more effective than plunging fire, because the beaten zone is much longer. Overhead fire with the rifle is safe when the ground affords protection to the friendly troops in front or when they are a sufficient distance below the line of fire.

14. *Effect of fire*.—By making use of cover and of the supporting fires of the artillery and machine guns, rifle units will get as near the enemy as possible without opening fire. Normally this should be at ranges less than 600 yards. Snipers or specially selected men may fire at a greater range. A ricochet is effective if it strikes a man soon after it leaves the ground. Rifle fire is seldom used against enemy matériel. Rifle fire is effective and should be used against low-flying planes. Even though hits can no longer be made, fire may be continued when the moral effect is sufficient to keep the enemy under cover and render his fire ineffective. When opposing forces are intrenched and neither side is trying to advance, fire for moral effect alone is of no value.

15. *Exercise No. 8—a. Purpose*.—To show trajectories.

b. *Method*.—The unit under instruction watches the firing of a few tracer bullets at targets whose ranges are announced. Ranges of 300, 600, and 800 yards are suitable selections. The flatness of the trajectories is called to the attention of the men.

SECTION V

APPLICATION OF FIRE

16. **General.**—*a.* An enemy attacking will present targets varying from advancing individuals and small groups to groups in defiladed or concealed firing positions. While the application of fire will be simpler when on the defensive, the moving targets at varying ranges and the fact that squads and sections will be dispersed in small groups over areas may make proper application difficult.

b. With an enemy on the defensive the targets he presents will usually consist of small groups such as riflemen, automatic riflemen, or machine guns. These groups will form an irregular general line very probably echeloned in depth. They will be placed to secure good fields of fire and to take advantage of cover and concealment. Except at close range they will generally be invisible and their location must be determined by observation of those positions they would logically occupy, by the noise and flash of firing, by movement or other indications. Any of these groups permitted to fire unmolested are of vital danger to our advance.

c. In the attack the necessity for extended and irregular formations echeloned in depth to take advantage of cover and concealment and prevent excessive losses may make it difficult to occupy positions from which the fire of the entire unit can be controlled. In many cases the unit may not be able to open fire as a whole but will have to build up fire gradually as individuals or small groups reach a firing position. In some cases a target may only be visible to portions of the unit while in others an efficient, well-controlled fire can be delivered by the entire unit.

d. The foregoing conditions should be considered in the preparation of all musketry exercises and an endeavor made to portray, as nearly as possible, battlefield conditions. Exercises should not be based on the more or less regular formations prescribed in the mechanics of extended order drill.

e. Considering the above, in the occupation of a firing position, the location of sections in the section area and squads in the squad area should be made with due regard to the following requirements. When these requirements conflict, it

is the duty of leaders to weigh the importance of each and make the best dispositions possible under the conditions.

(1) Good field of fire to the front.

(2) Use of cover and concealment.

(3) An indefinite and inconspicuous formation which will suit the terrain and be hard to see.

(4) Control of fire by unit leader.

17. Kinds of fire.—The size and nature of the target presented may call for the fire power of the entire group or only certain parts. The fire of a group must necessarily be either distributed or concentrated fire.

a. Distributed fire.—(1) Distributed fire is fire distributed in width for the purpose of keeping all parts of the target under effective fire. It is habitually used on targets having any considerable width and no special command for its use is necessary.

(2) Distributed fire is individual and collective. Each rifleman fires his first shot on that portion of the target corresponding generally to his position in the squad. He then distributes his remaining shots over that part of the target extending a few yards to the right and left of his first shot. The amount of target he can cover to the right and left of his first shot will be that on which he can deliver accurate fire without having to change his firing position. This will usually be from 5 to 10 yards. It will depend upon the range and the position of the firer. Unless otherwise instructed, the automatic rifleman will habitually cover the entire target. This method enables squad leaders to distribute the fire of their units so as to cause the entire target to be kept under fire.

(3) Distributed fire is the quickest and most effective method of insuring that all parts of the target are brought under fire. When it becomes necessary to engage other targets, the squad leader will shift the fire of such weapons as may be necessary.

b. Concentrated fire.—Concentrated fire is fire directed at a single point. This fire has great effect but only at a single point. Machine guns and automatic rifle groups are examples of suitable targets for concentrated fire.

18. Rate of fire.—The soldier fires at the rate of fire most effective under existing conditions. To exceed this rate is a waste of ammunition.

a. Rifle.—In rapid-fire practice the soldier is trained to shoot from 7 to 10 aimed shots per minute, depending upon the

range. In battle, the difficulty in picking out indistinct targets will generally make a slower rate of fire advisable.

b. Automatic rifle.—The high rate of fire of the automatic rifle makes it very important in maintaining fire power. Every effort will be made to keep the automatic rifles in action. The most effective rate of fire is from 40 to 60 shots per minute. The fire of automatic rifles is particularly valuable against targets requiring the greatest volume of fire.

19. Fire discipline.—*a.* Fire discipline is a state of order, coolness, efficiency, and obedience, existing among troops engaged in a fire fight. Fire discipline is necessary for proper control by leaders and upon this control depend teamwork and effectiveness of the collective fire of the unit. The training necessary to insure good fire discipline can not be completed during the brief period of the course in musketry. Training in fire discipline starts with the soldier's first drill and continues throughout his military training. Any drill or exercise which develops alertness and the habit of obedience or other soldierly qualities will aid in developing the character essential to fire discipline.

b. Fire discipline is maintained by leaders chiefly by their example of coolness and courage. Replacement of casualties is an element of fire discipline which keeps the unit working as a team in spite of losses.

c. Fire discipline in the section is maintained by the section guide. While the responsibility for fire discipline remains with the section leader, it is best that he should be free to devote his entire attention to the enemy and to the general control of his section. The section guide sees that the squad leaders properly perform their duties, and any breaches of discipline in a squad are preferably checked through the squad leaders.

d. Fire discipline in the squad is maintained by the squad leader. His position in the rear of the squads permits him to observe its members easily.

e. In an emergency, or when the control by section leader is impracticable, the squad leader acts on his own initiative in carrying out what he believes to be the desire of the section leader.

f. Similarly, if any group of individuals find themselves without a leader, it is essential that one of them assume leadership of the group and carry out its mission or attach it to the nearest organized unit.

g. An individual separated from his squad fights on his own initiative only when he has reason to believe that his single effort will accomplish some important result. Otherwise he reports to the nearest leader at once.

20. Fire control.—*a. Meaning.*—Fire control is the regulation of rifle fire by section and squad leaders. It enables leaders to bring the fire of the rifles and automatic rifles of their units to bear on a designated target in the most effective manner. With fire control, leaders can cause all or a desired portion of their men to cease firing promptly or to engage a new target. Leaders can also increase or decrease the rate of fire.

b. Importance.—Fire control is essential to teamwork and the effectiveness of collective fire. Without fire control, men can not intelligently help to carry out the plan of the leader of the unit. Uncontrolled fire is often worse than useless. It wastes ammunition and discloses the position of troops to the enemy with no compensating advantages.

c. How exercised.—(1) Squad and section leaders exercise fire control by means of orders, commands, and signals.

(2) The effectiveness of the section leader's control of the section will depend very largely on the alertness of the squad leaders in glancing frequently at the section leader for signals. When signals are to be expected the squad leaders glance at the section leader about once every 10 or 15 seconds.

(3) The signals most frequently used in fire control are (B. F. M. Vol. II)—

Signals for range.

Commence firing.

Fire faster.

Fire slower.

Cease firing.

Assault fire.

Fix bayonets.

(4) Fire control of the section is retained by the section leader as long as he is able to do so. The section leader will often lose control of the section but should regain it as soon as conditions permit.

(5) In the squad, the fire control is exercised by the squad leader alone. In the section, fire control is exercised by the section leader assisted by the section guide.

21. Duties of leaders.—The following summary of duties of leaders is by no means complete as it relates only to their duties in musketry.

a. Section leader.—The primary duties of the section leader relate to the enemy and the most effective use of the fire power of his section. He—

- (1) Carries out orders of platoon leader.
- (2) Selects firing positions.
- (3) Determines ranges.
- (4) Designates targets and issues fire orders to the squad leaders.

- (5) Controls fire of section.
- (6) Observes enemy and effect of fire.
- (7) Prevents exhaustion of ammunition.
- (8) Replaces leaders who are casualties.

b. Section guide.—The primary duties of the section guide relate to individual conduct and discipline in the section. He—

- (1) Assists section leader.
- (2) Maintains fire discipline.
- (3) Controls fire of section during absence of section leader.
- (4) Keeps on alert for signals from platoon leader or section leader.

- (5) Replaces section leader when he becomes a casualty.

c. Squad leader.—(1) Carries out orders of section leader.

- (2) Selects firing positions for squad.
- (3) Designates targets and issues fire orders.
- (4) Controls fire of squad.
- (5) Maintains fire discipline.
- (6) Observes enemy and effect of fire.
- (7) Keeps on the alert for signals from the section leader.
- (8) Participates in firing only in emergencies when the fire of his rifle is considered more important than supervision of the squad.

SECTION VI

LANDSCAPE TARGET FIRING

22. Scope and importance.—*a.* After satisfactory progress has been made in the preceding steps, the soldier will be given practice in the application of those lessons by firing at landscape targets.

b. An advantage of this training is the immediate supervision over all members of the firing unit made possible by their close proximity. The instruction is therefore more individual than would be otherwise possible.

c. An added advantage is the accessibility and nature of the targets which permit the application and effect of the fire to be shown in a minimum of time.

d. This form of instruction also lends itself to indoor instruction when lack of facilities or weather conditions make it desirable. When ranges other than 1,000-inch become necessary, proper adjustment for sight setting and arrangement of targets must conform to the range used.

23. Description of target.—*a.* A landscape target is a panoramic picture of a landscape, and is of such size that all, or nearly all, of the salient features will be visible at a distance of 1,000 inches. Standardized sets of landscape targets are issued by the Ordnance Department in three series. Series A has five sheets and presents a more diversified terrain than either series B or C which consist of three sheets each. While series B and C are satisfactory for instruction purposes, it is preferable to use series A when facilities for installing it are available.

b. The landscape-target sheets are lithographed in colors and are relatively expensive. In order to avoid wastage, black and white replicas of the colored targets are furnished for use as recording sheets. They are set up and rifle sights adjusted or harmonized, as explained hereinafter, so that a shot aimed at any point on the colored panel will actually strike the corresponding point on the black and white panel. The colored sheets are known as "target sheets"; the black and white sheets are called "recording sheets." The latter are of the same width and slightly higher than the target sheets and show the identical terrain features. The recording sheets are placed exactly above the target sheets so that corresponding points are in the same vertical plane.

24. Weapons to be used.—Firing at landscape targets should be with cal. .22 rifles, preferably the M 1922 MI equipped with the Lyman sight. When a sufficient number of those rifles are not available, the cal. .30 rifles may be used.

25. Preparation of targets.—*a. Mounting.*—(1) The sheets are mounted on frames made of 1 by 2 inch dressed lumber, with

knee braces at the corners. The frames for the target sheets are 24 by 59 inches, while those of the recording sheets are the same width but slightly higher. These frames are covered with target cloth, which is tacked to the edges. It is advisable to paint the frames, but it is not necessary.

(2) The colored sheets are mounted as follows: Dampen the cloth with a thin coat of flour paste and let it dry for about an hour; apply a coat of paste similarly to the back of the paper sheet and let it dry about an hour; apply a second coat of paste to the back of the paper and mount it on the cloth; smooth out wrinkles, using a wet brush or sponge, and work from the center to the edges. The frame must be placed on some surface which will prevent the cloth from sagging when the paper is pressed on it. A form for this purpose can easily be constructed. It must be of the same thickness as the lumber from which the frames are built, and must have approximately the same dimensions as the aperture of the target frame.

(3) Recording sheets are not pasted but simply tacked on the frames. Thumb tacks are preferable for this, though carpet tacks battened by small pieces of cardboard are less expensive. These sheets must be tacked on so that they are exactly placed with reference to the corresponding target sheet above which they are set up, a proceeding which must be carried out with great care and accuracy or the results of the shooting will be of little value. The target sheets may be mounted on beaver board instead of canvas-covered frames. Board mounting for the recording sheets is an unsatisfactory arrangement.

b. Target frames.—Panels mounted as described above are set in a vertical frame consisting of posts (about 4 by 4 inches) of sufficient height, placed upright in the ground, 5 feet from center to center, with horizontal pieces of 2 by 4 inches to support the panels, braced to insure stability. The panels are supported by cleats and dowels in order to allow for easy removal. The recording panels are placed above the colored panels, care being taken that every point on the recording targets is exactly the same distance above the corresponding point on the colored target and in the same vertical line with it. The distance is 23 inches. This effect can be obtained by the use of a plumb bob and a 2-foot ruler, or of a carpenter's level upon which the 23-inch distance has been marked. Since the black and white targets are tacked on, their position can be shifted slightly until they are correctly placed.

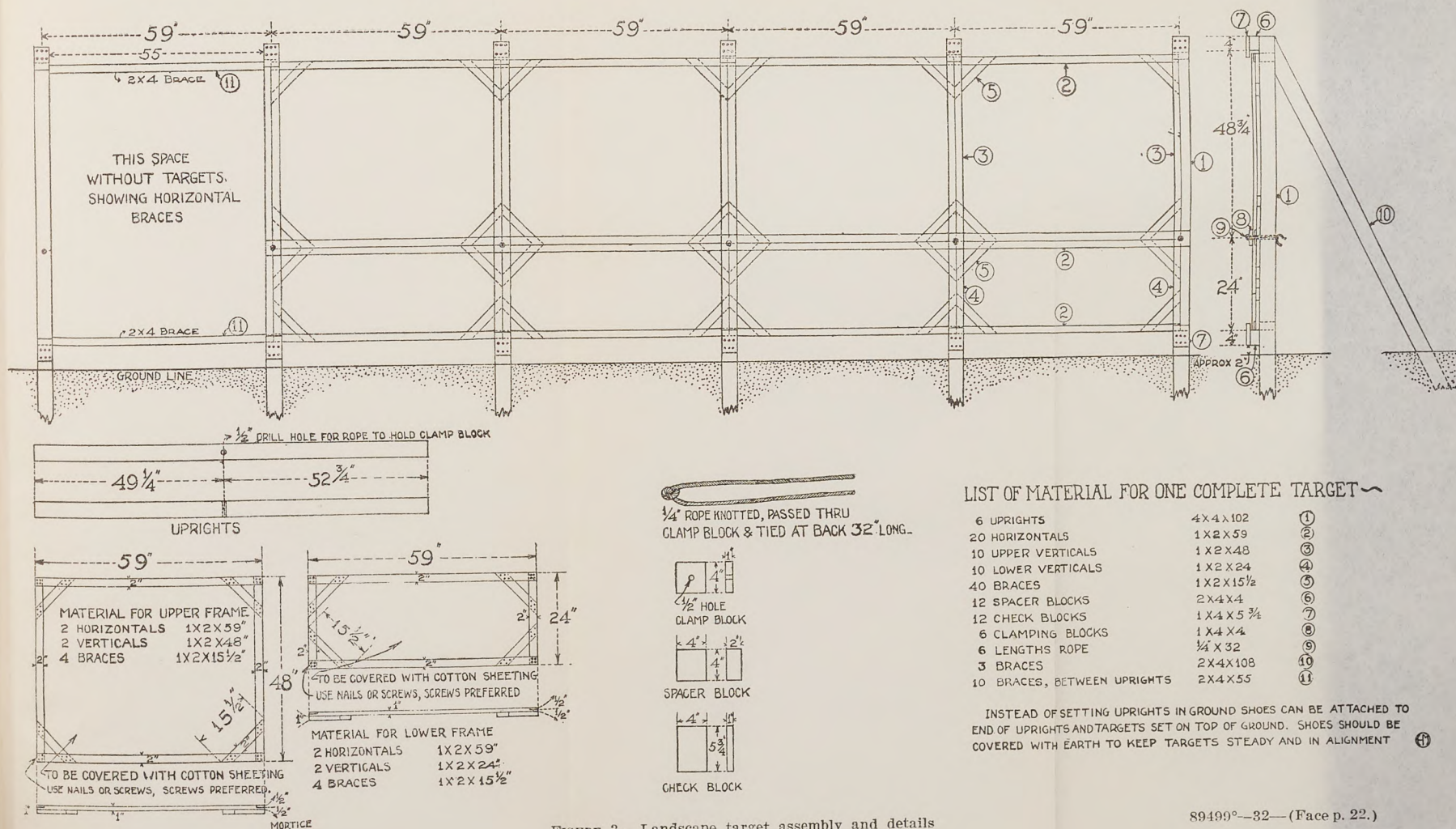


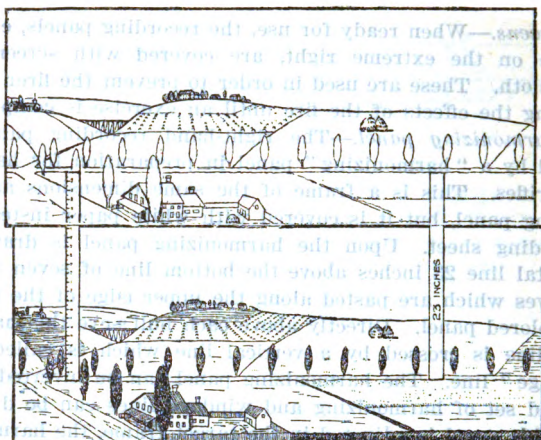
FIGURE 3.—Landscape target assembly and details

c. Screens.—When ready for use, the recording panels, except the one on the extreme right, are covered with screens of target cloth. These are used in order to prevent the firer from observing the effects of the fire until an exercise is completed.

d. Harmonizing panel.—The right-hand recording panel is replaced by a "harmonizing" panel in preparation for harmonizing rifles. This is a frame of the same dimensions as the recording panel, but it is covered with white paper instead of a recording sheet. Upon the harmonizing panel is drawn a horizontal line 23 inches above the bottom line of seven small bull's-eyes which are pasted along the upper edge of the right-hand colored panel. Directly above each bull's-eye this harmonizing line is crossed by a vertical line which is called the "windage" line. The harmonizing panel can be inverted, and a second set of harmonizing and windage lines can be drawn. When this panel is adjusted in the target frame, the harmonizing of rifles can commence. The right-hand recording panel must later be replaced if targets on the corresponding colored panel are to be selected during the instruction period.

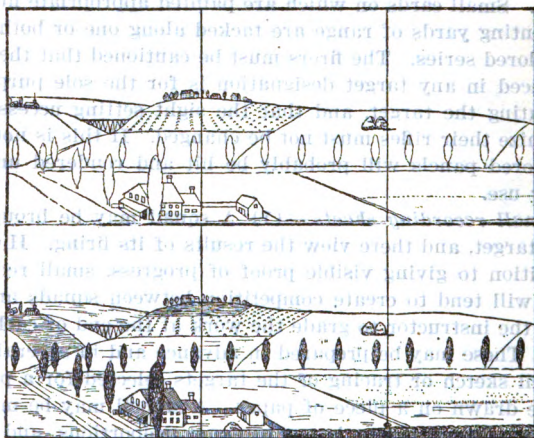
e. Range indicators.—In order to make all elements of target designation complete, assumed ranges must be used on landscape targets. Small cards on which are painted appropriate numbers representing yards of range are tacked along one or both edges of a colored series. The firers must be cautioned that the range announced in any target designation is for the sole purpose of designating the target, and that the sight setting necessary to harmonize their rifles must not be changed. If this is not done, the colored panels will probably be hit and rendered unfit for further use.

f. Small recording sheets.—(1) A squad may be brought up to the target, and there view the results of its firing. However, in addition to giving visible proof of progress, small recording sheets will tend to create competition between squads and will enable the instructor to grade the work at the end of each day's firing. These may be prepared in advance and in several ways. A pencil sketch or tracing of the targets selected for a problem may be drawn on a piece of paper. A stencil may be made on which a selected target is cut to exact proportions, and a supply of small recording sheets may then be mimeographed. (Figs. 5 and 6.) A tracing can be made on tracing cloth, and copies prepared by blue printing.



TAKE TWO POINTS ON RECORDING SHEET AND SEE THAT MEASUREMENT IS EXACTLY 23 INCHES FROM SAME TWO POINTS ON COLORED PANEL. THIS CHECKS VERTICAL DISTANCE —

NOTE.—These measurements must be exact.



THEN TAKE PLUMB BOB AND SEE THAT BOTH PANELS ARE IN LINE HORIZONTALLY, (TAKE SOME PROMINENT OBJECT SUCH AS EDGE OF HOUSE OR TRUNK OF TREE) THEN TACK IN PLACE.

FIGURE 4.—Method of lining up recording sheet

(2) It is advisable to show on the small recording sheet the 50 and 75 per cent zones. These represent the 50 and 75 per cent shot groups to be expected of average shots firing at 1,000 inches, and are proportional to corresponding shot groups at longer ranges. While shot groups are in the form of a vertical ellipse, these zones are shown on the recording targets as rectangles. This is for convenience in the preparation of the small targets. The 50 per cent zone is a rectangle $2\frac{1}{2}$ inches high by 2 inches wide; the 75 per cent rectangle is 5 inches high by 4 inches wide. The target is at the center of the inner rectangle, or 50 per cent zone.

(3) For a linear target, such as a small area over which the automatic rifleman will distribute his fire, the 50 per cent zone is formed by two parallel lines, $2\frac{1}{2}$ inches apart, drawn parallel to the longer axis of the target (area) and with the target midway between those lines. Two additional lines, 5 inches apart and similarly drawn, form the 75 per cent zone. The width of the zones will vary according to the size of the target selected. The zones extend 1 inch beyond each end of the target. The zones are then divided into equal parts, the number depending upon the length of the target.

(4) These small recording sheets are placed on the recording panel directly over that portion to which they correspond. They will thus be 23 inches above the chosen target on the colored panel. After firing has been completed, the small sheets should be removed, graded, and posted on the bulletin board.

(5) If these small sheets can not be prepared, wire frames conforming to the above-outlined dimensions can easily be made. After firing has been completed, the zones can be shown to the squad by applying the frame to the target on the recording sheet.

26. Harmonizing sights.—*a.* If the sights of the cal. .22 rifle are set at 82 minutes elevation, or the sights of the cal. .30 rifle are set at 1,800 yards, a shot fired at a target 1,000 inches away will strike about 23 inches above the point of aim. With a range setting of 1,300 yards on the service rifle, one point right windage is necessary to counteract the drift correction. In all firing for harmonizing, sandbag rests are used.

b. The procedure in detail is as follows:

(1) Sights of all rifles are blackened.

(2) The squad is deployed on the firing point; the squad leader takes the proper position in rear of the squad.

(3) The instructor causes each firer to set his sights at 82 minutes elevation and zero windage, or 1,300 yards and one point right windage for the service rifle, and checks each rifle.

(4) Each man is assigned, as an aiming point, the particular small black paster along the upper edge of No. 5 colored panel which corresponds to his position in the squad.

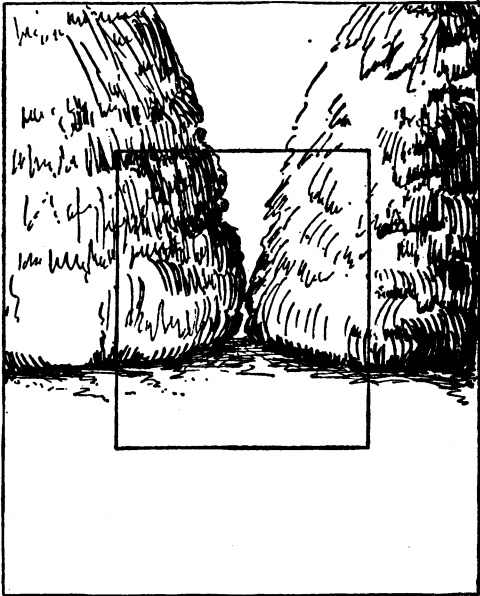


FIGURE 5.—Scoring sheet for landscape targets (point target)

(5) Rifles are loaded with one round only, at the command of the instructor.

(6) Each man fires one shot at his spotter at the instructor's command: **ONE ROUND, FIRE AT WILL.**

(7) The instructor commands: **OPEN BOLTS.** The squad leader checks to see that this is done.

(8) The instructor and squad leader inspect the harmonizing panel and give each man the necessary correction for his next

shot; as, "Up one minute, right one-half point"; or, for the service rifle, "Up twenty-five, left one."

(9) The firing continues as outlined above until all rifles are harmonized; that is, until each man has approximately hit the intersection of the lines above his aiming paster.

c. For the cal. .22 rifle with the Lyman receiver sight, a change of five minutes in elevation will move the strike of the bullet about $1\frac{1}{2}$ inches. A change of one point of windage

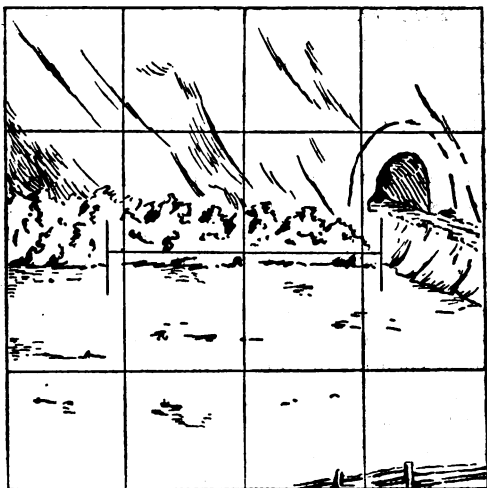


FIGURE 6.—Scoring sheet for landscape targets
(area targets)

moves the strike about $1\frac{1}{4}$ inches. For the cal. .30 rifle, changes of 25 yards in elevation and one point of windage move the strike of the bullet about 1 inch in each direction.

27. Firing procedure.—The following is the sequence of events in conducting firing exercises:

a. All members of the squad, except the squad leader, face to the rear.

b. The instructor takes the squad leader to the panels and points out the target to him.

c. They return to the firing point; the squad leader takes charge of the squad and causes the men to resume their firing

positions. The sandbag rest is used only by the automatic rifleman, and then only when armed with the automatic rifle.

d. The squad leader gives the command *Load*, cautioning, "— rounds per rifleman and — rounds per automatic rifleman only."

e. The squad leader orally designates the target. Reference to panels should not be allowed in the designation. To complete the fire order, the squad leader adds *fire at will*.

f. When the squad has completed firing, the squad leader commands: **CEASE FIRING, OPEN BOLTS**. The squad is taken forward to examine the target. The small recording target is removed, scored, and marked with the squad number.

g. The instructor holds a short critique after each exercise.

28. Scoring—*a. Concentrated fire.*—In concentrated fire the sum of the value of the hits within the two zones is the score for the exercise. For convenience of scoring and comparison, 100 is fixed as the maximum score. Any method of scoring and of distribution of ammunition among members of the squad may be used. The following examples are given as suggested methods:

- (1) Number of rounds fired, 50.
- (2) Value of each hit in 50 per cent zone, 2.
- (3) Value of each hit in 75 per cent zone, 1.

NOTE.—A satisfactory distribution of the ammunition is, automatic riflemen 10 rounds, riflemen 6.

b. Distributed fire.—The following is a method of scoring for distributed fire; such as, automatic rifle fire over a small area, or the fire of the squad on an enemy column:

- (1) Number of rounds fired, 50.
- (2) Value of each hit in 50 per cent zone, 2.
- (3) Value of each hit in 75 per cent zone, 1.
- (4) Value of each distribution space (if target is divided into four equal spaces), 25.
- (5) The score for distribution, plus the value of all hits, divided by two is the score for the exercise.

29. Exercises.—The fire of the automatic rifleman, when armed with the cal. .22 rifle, will be employed against targets appropriate to automatic rifle fire and as though he were firing such weapon.

a. Exercise No. 9—(1) Purpose.—To teach target designation and to show the effect of concentrated fire.

(2) *Method*.—The squad leader employs the fire of his squad at one point target indicated to him by the instructor.

b. *Exercise No. 10*—(1) *Purpose*.—To teach target designation and the use of the automatic rifle at a separate target.

(2) *Method*.—The instructor indicates two targets to the squad leader. The squad leader applies the fire of the riflemen on one target and the fire of the automatic rifleman on the other.

c. *Exercise No. 11*—(1) *Purpose*.—To teach target designation and the division of the squad fire on three points of concentration.

(2) *Method*.—The instructor indicates three point targets to the squad leader, giving the nature of each. The squad leader applies the fire of his squad on the three targets in the proportions he believes appropriate. The scoring will be as for concentrated fire; the several scoring sheets used being combined in totals for the score of the exercise.

d. *Exercise No. 12*—(1) *Purpose*.—To teach target designation and fire control in diverting part of the fire of the squad to a suddenly appearing target.

(2) *Method*.—The instructor indicates a point target to the squad leader. After firing has commenced, the instructor indicates and gives the nature of a new target to a flank. The squad leader applies the fire of his squad to the first target. When the second target is indicated, he switches what he believes an appropriate amount of fire from the first to the second target.

e. *Exercise No. 13*—(1) *Purpose*.—To teach target designation, fire control, and the method of searching a small area with automatic rifle fire.

(2) *Method*.—The instructor indicates and gives the nature of two-point targets. After firing has commenced, the instructor indicates a small area in which an enemy group is under cover. The squad leader applies the fire of his squad on the two-point targets according to their nature. When the area target is indicated, he switches the fire of his automatic rifleman to that target.

f. *Exercise No. 14*—(1) *Purpose*.—To teach the application of fire on an enemy group marching in formation, the fire control necessary to obtain fire for surprise effect, and to show the effect of fire on troops in formation.

(2) *Method*.—The instructor indicates to the squad leader a target that represents a small group of the enemy marching in approach march formation, formation for patrol, or the like; the enemy not being aware of the presence of the squad. The squad leader applies the fire of his squad; his instructions must result in the simultaneous opening of fire of all weapons and the distribution of fire over the entire target. The assignment of the three riflemen on the right to fire at the rear half of the target, and the remaining riflemen at the forward half, is a satisfactory method of distributing fire over such target. The automatic rifleman will normally fire at that part of the target that presents the greatest mass.

SECTION VII

FIRING AT FIELD TARGETS

30. *Scope of training*.—The training in this step is similar to that given the soldier in landscape target firing, but with the added features of firing the service rifle at field targets at unknown ranges, the use of cover, fire control under more difficult conditions, and range estimation.

31. *General considerations*—*a. Movement*.—Musketry exercises with field targets shall not involve movement of the firing unit beyond the initial firing position. The inclusion of the training in moving from an approach-march formation, or place of concealment, to firing positions is, primarily, to teach the soldier the proper use of cover and selection of firing positions.

b. Firing positions and representation of enemy.—(1) A unit shall not be deployed in a line of skirmishers, that is, with individuals approximately abreast and at regular intervals apart, when under enemy fire or observation. Accordingly, the firing position of a squad or section will be the general line formed by the firing positions of individuals and small groups (two to four men), disposed laterally and in depth at greatly varying distances. The selection of individual and group positions is governed by the field of fire, cover or concealment while firing, cover of approach to those positions, fire control, and nature of target.

(2) The representation of the enemy by targets will conform to that principle.

32. Situations for firing exercises.—*a.* Each exercise will be initiated by a unit either—

(1) Already deployed in a firing position.

(2) Halted in approach-march formation or in a place of concealment with scouts present in formation, the unit either acting alone or as part of a larger force.

(3) Advancing in approach-march formation, with scouts out.

b. In situation (1) above each man will be in a carefully selected firing position, special attention being paid to individual cover and concealment.

c. In situation (2) above squad leaders select the firing positions for the members of their squads; they conduct their squads forward by concealed routes and send the riflemen to their firing positions by individual directions. Occupation of the initial firing position of a unit is done with the minimum of exposure.

d. In situation (3) above the scouts must be checked by an assumed enemy fire when they are at a suitable location for a firing position of the squad; otherwise, if they are permitted to advance beyond this position, they must be withdrawn from the exercise before firing is begun by the squad.

33. Use of cover.—*a.* The use of available cover is important for two reasons. The man who neglects the use of cover will be seen and hit. His squad not only loses the fire effect of one rifle, but its position is unnecessarily disclosed and other casualties may follow.

b. The individual use of cover and concealment is taught in scouting and patrolling. In musketry the principles are the same.

c. In seeking cover in a firing position men may move a few yards in any direction, but they must not be allowed to bunch together behind concealment which does not afford protection from fire. They avoid positions which will mask the fire of others or cause their own fire to be dangerous to other men of their unit.

34. Moving targets.—When firing at a man walking across, or at right angles, to the line of fire the points of aiming at the various ranges are as follows:

a. At 100 yards, aim at forward half of body.

b. At 200 yards, aim at forward edge of body.

c. At 300 yards, lead him one-half the width of his body.

d. At 400 yards, lead him the width of his body.

35. Marksmanship applied.—*a.* The principles of rifle marksmanship are followed in combat in so far as they fit the conditions, but whenever the conditions make a modification of the principles more effective than strict and detailed compliance with them, such modification is properly made.

b. The principles of marksmanship should be applied to musketry and to combat in a common-sense way. It should be appreciated that the conditions encountered in each combat situation will differ from those found on the target range. For example, it will often be impracticable to keep the sights blackened in combat, although it will be of advantage to do so when possible. On the target range the soldier is expressly prohibited from resting his rifle against an unauthorized rest while firing. In battle the soldier takes advantage of trees, rocks, or any other rest which will make his fire more accurate. The positions used in rifle marksmanship are used in combat whenever the ground will permit, but on rough ground it is often necessary to modify them in order to get a comfortable and steady position. The loop sling is preferable except—

- (1) In the standing position.
- (2) When the situation requires readiness for immediate use of the bayonet.
- (3) In emergencies demanding immediate fire without time for adjustment of the loop sling.

36. Use of the battle sight.—The battle sight corresponds to a range of about 550 yards. It is less accurate than the peep sight and is used only when time is lacking for setting the peep sight, or in firing at aircraft. By keeping the sight habitually set at 300 yards when not in use, the soldier has two sights ready for emergencies.

37. Rate of fire.—*a.* In rapid-fire exercises the soldier is trained to shoot from 7 to 10 aimed shots per minute, depending on the range. In battle the difficulty in picking out indistinct targets will generally make a slower rate of fire advisable. Every shot must be carefully aimed and fired by squeezing the trigger as taught in rifle marksmanship or the fire will soon become scattered and ineffective.

b. It is impossible for leaders to prescribe or enforce the most effective rate of fire. It will vary with conditions and with individuals under the same conditions. It is the duty of

leaders, however, to control the rate of fire to the extent that they will correct men who fire so fast as to prevent careful aim and trigger squeeze, as well as those who waste time by improper reloading or by using poor positions. In the excitement of battle it is the tendency of men to fire too fast. This tendency must be overcome by training and by careful supervision in battle.

c. The most effective rate of fire for the automatic rifle is from 40 to 60 rounds per minute. The selection of the rate of fire to be used will be governed by the nature of the target.

38. Assault fire.—*a.* Assault fire can sometimes be used to advantage when within 150 yards of an enemy if his fire is not effective. It is particularly effective in woods fighting. Its moral effect may serve to keep the enemy down or drive him from the position. It has the disadvantage of making the attackers very conspicuous and vulnerable to the fire of any enemy troops within effective range.

b. While delivering assault fire the firing line advances at a walk. Riflemen halt individually, aim and fire, standing. They go forward a few steps, halt, and fire again, keeping on a general line. They load while advancing. Bayonets are fixed before taking up the assault fire. The automatic rifleman fires semi-automatic fire while steadily advancing; the piece being carried in a horizontal position with the butt tightly clamped under the arm pit. Riflemen fire straight to the front. Automatic riflemen distribute their fire along the enemy position within limits which will provide safety to the men on their right and left.

39. Exercises—*a. Exercise No. 15.*—(1) *Purpose.*—Practice in firing at moving targets.

(2) *Method.*—Riflemen and automatic riflemen fire individually at B targets carried on long sticks by men in the pits of a class A range. The men in the pits are each assigned a space, the width of about five regular range target spaces, in which they walk continuously back and forth. By whistle signal, targets are exposed to the firing line for five seconds and then concealed for five seconds. Targets are exposed once for each shot to be fired. On the firing line one man is assigned to each target. Ranges of 200 or 300 yards are best suited for this class of firing.

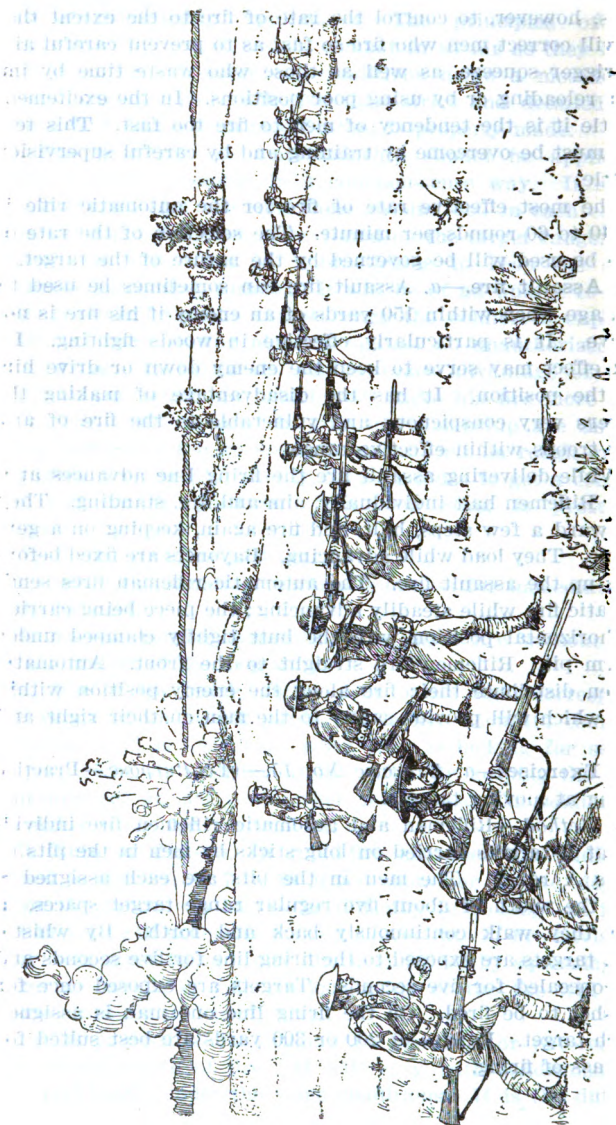


FIGURE 7.—Assault fire

b. Exercise No. 16—(1) *Purpose.*—Practice in target designation and application of the fire of a squad in position.

(2) *Method.*—Fairly visible targets, at about 400 yards range, represent the enemy in three small groups of from two to four men each. The squad is in position, with each man in a carefully selected firing position, particular attention being paid to individual concealment. The squad leader designates the targets and assigns the fire of his squad according to the nature of each target.

c. Exercise No. 17—(1) *Purpose.*—Practice in fire control and fire discipline of a squad in position.

(2) *Method.*—With the enemy represented by two groups of targets, the fire of the squad is applied as in Exercise No. 16. After 20 or 30 seconds of firing, a new target appears about 150 yards to the flank of the first target. As much of the fire power of the squad is diverted to the new target as is appropriate according to the nature of that target.

d. Exercise No. 18—(1) *Purpose.*—Practice in the application of automatic rifle fire over a small area in which an enemy is concealed.

(2) *Method.*—Targets are placed within a small area, exposed to fire but concealed from view. An automatic rifleman is directed to search that area with fire. He distributes his fire throughout the length and breadth of the area using a rapid rate of fire.

e. Exercise No. 19—(1) *Purpose.*—Practice in target designation by scouts and to teach how to approach and assume a firing position for a squad.

(2) *Method.*—The squad is marching in approach march formation with both scouts well in advance. When the scouts reach the firing position they observe the targets representing an enemy group about 400 yards to their front. They determine the range by firing on the target with tracer bullets. The squad leader conducts his squad forward, establishes the men in firing positions, and engages the targets with the proper class of fire, after the targets have been designated by the scouts by the use of tracers. Special attention is paid to the use of cover and concealment of all men while moving up and during the selection and occupation of positions.

f. Exercise No. 20—(1) *Purpose.*—Practice in the application of fire at an enemy formation.

(2) *Method.*—Fully exposed E targets are placed so as to represent about a squad of the enemy marching in patrol or other formation and with the longer axis of the formation at about right angles to the line of fire of the squad undergoing instruction. The latter squad is marching in combat patrol formation with one scout well in advance. When the scout reaches the firing point he observes the target, takes cover, and signals, "Enemy in sight in small numbers," to his squad leader. The squad leader places his squad in firing positions and engages the target with surprise effect. The fire control must be such that the fire will commence suddenly and in large volume. Special attention is paid to the concealment of all men until fire is begun. Fire is applied as in Exercise No. 14.

g. Exercise No. 21.—(1) *Purpose.*—Practice in target designation and the application of the fire of a section in position.

(2) *Method.*—Partly exposed targets represent two squads of the enemy disposed in small groups and one machine gun, at a range of about 400 yards. The section leader applies the fire of his section by squads or smaller groups, according to the nature of the enemy group to which each is assigned.

h. Exercise No. 22.—(1) *Purpose.*—Practice in fire control and fire discipline of a section in position.

(2) *Method.*—Partly exposed targets represent about a section of the enemy disposed in small groups about 400 yards to the front. The section leader applies the fire of his section on those targets. After about one-half minute of firing, targets representing a machine gun and three or four riflemen appear at a flank and at a greater range. The section leader diverts the appropriate amount of fire to the new targets.

i. Exercise No. 23.—(1) *Purpose.*—To teach the section how to approach and assume an initial firing position, moving from a position of concealment; to give leaders practice in their duties.

(2) *Method.*—Four to six enemy groups are represented by partly exposed targets placed from 300 to 400 yards in the front. The platoon leader has ordered the section leader to move his section from its present place of concealment to a firing position to the front and engage the enemy by fire. The section leader makes a hurried survey or reconnaissance of the ground, gives his fire order to the assembled squad leaders, instructs them relative to routes of approach and areas to be

occupied, then controls the fire of his section when firing is begun. The squad leaders establish their squads in their assigned areas and engage the targets in conformity with the section leader's fire order.

SECTION VIII

SAFETY PRECAUTIONS AND ADVICE TO INSTRUCTORS

40. Safety precautions.—*a.* In general, the safety precautions used on the target range apply with equal force to musketry firing and even greater vigilance and care are necessary due to the irregular formations and the movement incident to some of the musketry exercises.

b. It will be explained to the troops that, in training, safety is the first consideration, and that whenever the firing of a musketry exercise is considered dangerous because of lack of training of the troops or for any other reason, the exercise will be modified so as to make it safe, or, if this is not practicable, it will be omitted.

c. When an exercise in which rifles are carried does not involve the firing of ball ammunition, rifles and belts will be inspected before the exercise to insure that no man has any ball ammunition in his position.

d. When ball ammunition is used it is preferably distributed when the unit is deployed on the firing point or initial point and the exercise is about to begin. Immediately upon the conclusion of the exercise all surplus ammunition will be collected and rifles and belts inspected to insure that none remain in the hands of the men.

e. For men of average training it is recommended that the following safety rule be enforced regarding the positions of men in an irregular firing line: No man will be farther to the front or to the rear of the man next in line than he is to the flank of that man. For instance, if the lateral interval between skirmishers is 5 paces, then no man will be more than 5 paces ahead of or behind the man next to him on either side. Furthermore, no man will fire in such direction that the bullet will pass closer than 6 feet to any man ahead of him who is not advancing, or closer than 30 feet to any man who is rushing forward. For poorly trained or excitable troops these

rules will be altered to provide the degree of safety necessary to prevent accidents.

f. The instructor in charge of an exercise is responsible for the safety of the firing, and it is his duty to take all safety precautions that he considers necessary under the conditions. No other officer can modify these safety precautions without assuming entire responsibility for the safety of the exercise.

g. During exercises rifles will be kept pointing down the range at all times. Special vigilance is necessary to see that men comply with this rule while using a cleaning rod to remove a cartridge or case which is stuck in the chamber.

h. Even when there are no targets or screen in front of a pit, overhead cover for the forward half of the pit will be provided.

i. Tracer ricochets are extremely erratic and for this reason the use of tracer ammunition is prohibited in all firing over pits occupied by personnel.

j. The firing of exercises will not be commenced until men in the pits have telephoned or signaled that all are under cover and the range clear.

k. Firing while advancing by rushes through woods or brush is dangerous because of the tendency of bullets to ricochet at wide angles after striking trees, stumps, and other obstacles.

41. General notes for instructors.—*a.* Practical musketry instruction, like marksmanship, includes the preparation of ranges and the procuring of equipment and supplies prior to the presentation of any exercise. Instructors must know thoroughly these details of instruction as well as the principles of musketry.

b. The time required for this preparation will depend largely on conditions and facilities at the post or camp where the instruction is to be given. Unless sufficient time is allowed the instruction will suffer.

c. The musketry training of regularly organized troops will generally be conducted by the company officers and supervised by higher commanders. In other cases, such as training camps, it will often be necessary or desirable to select specially qualified officers to conduct or supervise the training in musketry.

42. Preparation by instructors.—*a.* The conditions under which musketry instruction is given will vary greatly. On some occasions there will be plenty of time and facilities of all kinds.

Usually both time and facilities will be limited. The first duty of the instructor is to map out a definite course of instruction, making it as complete and effective as conditions will permit. Knowing the number of troops or students he is then able to make out a list of equipment and supplies needed and to make definite plans for work on the range. The instructor insures himself that his assistants are familiar with musketry and the subjects upon which it depends. He makes known to them his course of instruction.

b. A squad or section trained in advance for demonstration purposes will expedite instruction.

43. Rifles.—When class B rifles are available for musketry training they should be used in preference to class A rifles because of the injurious effects of tracer ammunition.

44. Field targets.—The appearance of the ordinary prone or kneeling silhouette depends a great deal upon the direction of the sun, the background of the targets, and the angle at which the targets are placed. Being flat, these targets have no appearance of solidity, and the effects of shade and shadow which render human targets visible at considerable distances are usually lacking in the case of silhouettes. These points should be taken into consideration in preparing an exercise, particularly when comparison of results is desired, to insure that all competing units have targets which are equally visible. The effect of solidity may be obtained by using two figures placed at right angles to each other or using a wide figure bent into a semicylindrical shape.

45. Exercises.—*a.* Instructors are not limited to the exercises given in the text. They should use their initiative and the available facilities in arranging additional exercises designed to give further practice in the application of musketry principles herein contained. Complex methods unsuited to battle conditions are to be carefully avoided in training.

b. It is generally desirable for the instructor to give a brief talk or critique at the close of each exercise. He explains how the exercise illustrates or gives practice in principles of musketry and calls attention to errors or to good work in the conduct of the exercise. Questions and discussion should be encouraged.

c. With some preparation most of the exercises can be fired on a class A range when there is no class B range available.

d. It is often desirable to rehearse exercises using simulated fire prior to firing them with ball ammunition.

e. To save time and ammunition, exercises may be executed by a single squad or section while the others look on. This expedient detracts from the thoroughness of training and is to be avoided when possible.

46. Interest.—*a.* The value of the course will depend largely upon the interest aroused. To arouse interest it is necessary to make men see the importance of the subject, giving illustrations of the application of musketry principles in battle.

b. To maintain interest requires that monotony be avoided by frequently introducing new ideas or new applications of principles. Many of the exercises can be treated as games or competitions.

INDEX

	Paragraph	Page
Battle sight; use in firing at field targets.....	36	32
Beaten zone.....	12	14
Collective fire; scheme of instruction.....	3	2
Definitions.....	1	1
Discipline, fire.....	19	18
Dispersion.....	10	14
Exercises; use by instructors.....	45	39
Field targets, firing at:		
Appearance of targets.....	44	39
Assault fire.....	38	33
Battle sight, use of.....	36	32
Cover, use of.....	33	31
Exercises.....	39	33
General consideration.....	31	30
Marksmanship applied.....	35	32
Moving targets.....	34	31
Rate of fire.....	37	32
Scope of training.....	30	30
Situations for firing exercises.....	32	31
Fire control.....	20	19
Harmonizing sights.....	26	25
Landscape target firing:		
Description of target.....	23	21
Exercises.....	29	28
Harmonizing sights.....	26	25
Preparation of targets.....	25	25
Procedure.....	27	27
Scope and importance.....	22	20
Scoring.....	28	28
Weapons to be used.....	24	21
Musketry:		
Instructors.....	41, 42	38
Interest to be aroused by instructors.....	46	40
Safety precautions.....	40	37
Training in.....	1-39	1-37
Range estimation:		
Eye, estimation by.....	5	3
Importance.....	4	3
Observation of fire.....	5	6
Tracer bullets.....	5	5
Reference point, target designation.....	7	8, 9

	Paragraph	Page
Rifle fire:		
Application; general.....	16	16
Beaten zone.....	12	14
Collective. <i>See</i> Collective fire.		
Comparison of oblique and frontal.....	13	15
Concentrated.....	17	17
Direction.....	13	14
Dispersion.....	10	14
Distributed.....	17	17
Effect of.....	14	15
Exercise.....	15	15
Fire control.....	20	19
Fire discipline.....	19	18
Grazing, plunging, and overhead.....	13	15
Importance of.....	2	2
Leaders, duties of.....	21	20
Rate.....	18	7
Shot groups.....	11	14
Trajectory.....	9	12
Rifles, available for musketry training.....	43	39
Safety precautions; musketry.....	40	37
Shot groups.....	11	14
Sights; target designation.....	7	8
Target designation:		
Exercises.....	8	10
Importance and methods.....	6	6
Oral description.....	7	7
Pointing.....	7	7
Reference point.....	7	8, 9
Sights.....	7	8
Tracer bullets.....	7	6
Tracer bullets:		
Range estimation by.....	5	5
Target designation by.....	7	6
Training, musketry, object.....	1	1
Trajectory.....	9	12



W3.63:3 pt. 1 / chap. 6 / ch. 1

BFM, Vol. III, Pt. One, Ch. 6
d1

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART ONE

RIFLE COMPANY

CHAPTER 6

MUSKETRY

CHANGES }
No. 1 }

WAR DEPARTMENT,
WASHINGTON, *January 2, 1936.*

Basic Field Manual, Volume III, Part One, Chapter 6, March 1, 1932, is changed as follows:

22. Scope and importance.

* * * *

d. This form of instruction also lends itself to indoor instruction when lack of facilities or weather conditions make it desirable.

[A. G. 062.11 (12-3-35).] (1935.)

23. Description of target.—*a.* A landscape target is a panoramic picture of a landscape, and is of such size that all, or nearly all, of the salient features will be **recognizable** at a distance of 1,000 inches. **The standard target is the series A target of five sheets in black and white.**

b. Rescinded.

[A. G. 062.11 (12-3-35).] (1935.)

25. Preparation of targets.—*a. Mounting.*—(1) The sheets are mounted on frames made of 1- by 2-inch dressed lumber, with knee braces at the corners. The frames for the target sheets are 24 by 60 inches. These frames are covered with target cloth, which is tacked to the edges. It is advisable to paint the frames, but it is not necessary.

49235°—36

(2) The target sheets are mounted as follows: Dampen the cloth with a thin coat of flour paste and let it dry for about an hour; apply a coat of paste similarly to the back of the paper sheet and let it dry about an hour; apply a second coat of paste to the back of the paper and mount it on the cloth; smooth out wrinkles, using a wet brush or sponge, and work from the center to the edges. The frame must be placed on some surface which will prevent the cloth from sagging when the paper is pressed on it. A form for this purpose can easily be constructed. It must be of the same thickness as the lumber from which the frames are built, and must have approximately the same dimensions as the aperture of the target frame.

b. Target frames.—Panels mounted as described above are set in a vertical frame consisting of posts (about 4 by 4 inches) of sufficient height, placed upright in the ground, 5 feet from center to center, with horizontal pieces of 2 by 4 inches to support the panels, braced to insure stability. The panels are supported by cleats and dowels in order to allow for easy removal.

c. Range indicators.—In order to make all elements of target designation complete, assumed ranges must be used on landscape targets. Small cards on which are painted appropriate numbers representing yards of range are tacked along one or both edges of a series of panels. The firers must be cautioned that the range announced in any target designation is for the sole purpose of designating the target, and that the sight setting necessary to zero their rifles must not be changed.

d. Scoring devices.—(1) A squad may be brought up to the target and there view the results of its firing. However, scoring the exercises will tend to create competition between squads and will enable the instructor to grade their relative proficiency. A scoring device conforming in size to the 50- and 75-percent shot groups to be expected of average shots firing at 1,000 inches, and at reduced ranges, can easily be made from wire, or a better one may be prepared by imprinting a scoring diagram on a sheet of transparent celluloid. After firing has been completed, the zones can be shown to the squad by applying the scoring device to the target.

(2) While shot groups are in the form of a vertical ellipse, the 50- and 75-percent zones should be shown by the devices as rectangles. This is for convenience in their preparation. For a distance of 1,000 inches the 50-percent zone is a rectangle $2\frac{1}{2}$ inches high by 2 inches wide; the 75-percent rectangle is 5 inches high by 4 inches wide. For a distance of 50 feet the 50-percent zone is a rectangle $1\frac{1}{2}$ inches high by 1.2 inches wide; the 75-percent rectangle is 3 inches high by 2.4 inches wide. The target is at the center of the inner rectangle, or 50-percent zone.

(3) For a linear target, such as a small area over which the automatic rifleman will distribute his fire, the 50-percent zone is formed by two parallel lines, drawn parallel to the longer axis of the target (area) and with the target midway between those lines. For a distance of 1,000 inches the lines should be $2\frac{1}{2}$ inches apart; for a distance of 50 feet the lines should be $1\frac{1}{2}$ inches apart. Two additional lines, similarly drawn, form the 75-percent zone. For a distance of 1,000 inches the lines should be 5 inches apart; for a distance of 50 feet the lines should be 3 inches apart. The width of the zones will vary according to the size of the target selected. For a distance of 1,000 inches the zones extend 1 inch beyond each end of the target; for a distance of 50 feet the zones extend .6 inch beyond each end of the target. The zones are then divided into a convenient number of equal parts, the number depending on the length (width) of the target and the number of men firing.

[A. G. 062.11 (12-3-35).] (1935.)

Figure 3, Landscape target assembly and details, is rescinded.

[A. G. 062.11 (12-3-35).] (1935.)

Figure 4, Method of lining up recording sheet, is rescinded.

[A. G. 062.11 (12-3-35).] (1935.)

26. Zeroing-in of rifles.—a. It will be necessary to zero-in the rifles used before firing exercises on the landscape target. A blank target with a row of seven 1-inch-square black pasters about 6 inches from, and parallel with, the bottom edge of the target should be prepared and used for this purpose. In all firing for zeroing-in, sandbag rests are used.

b. * * *

* * * * *

(3) The instructor causes each firer to set his sights at **zero** elevation and **zero** windage, or **100** yards and **zero** windage for the service rifle, and checks each rifle.

(4) Each man is assigned, as an aiming point, the particular small black paster which corresponds to his position in the squad.

(5) Rifles are loaded with **three rounds** only, at the command of the instructor.

(6) Each man fires **three shots** at his spotter at the command: **THREE ROUNDS, FIRE AT WILL.**

* * * * *

(8) The instructor and squad leader inspect the **target** and give each man the necessary correction, **based upon the location of the center of impact of the resultant shot group, for his next shot**; as "Up 1 minute, right one-half point"; or, for the service rifle, "Up 25, left 1."

(9) The firing continues as outlined above until all rifles are **zeroed in**; that is, until each man has hit his aiming paster.

c. For the cal. .22 rifle with the Lyman receiver sight, **at a distance of 1,000 inches**, a change of 5 minutes in elevation will move the strike of the bullet about $1\frac{1}{2}$ inches. A change of one point of windage moves the strike about $1\frac{1}{4}$ inches. **At a distance of 50 feet a change of 6 minutes in elevation will move the strike of the bullet about 1 inch, and a change of one point of windage, about $\frac{3}{4}$ of an inch.** For the cal. .30 rifle, **at a distance of 1,000 inches**, changes of 25 yards in elevation and one point of windage move the strike of the bullet about 1 inch in each direction. **At a distance of 50 feet a change of 25 yards in elevation and one point of windage will move the strike of the bullet about $\frac{3}{8}$ of an inch in each direction.**

[A. G. 062.11 (12-3-35).] (1935.)

Figure 5, Scoring sheet for landscape targets (point target), is rescinded.

[A. G. 062.11 (12-3-35).] (1935.)

Figure 6, Scoring sheet for landscape targets (area targets), is rescinded.

[A. G. 062.11 (12-3-35).] (1935.)

27. Firing procedure.—* * *

* * * * *

e. The squad leader orally designates the target. Reference to panels to indicate direction should not be allowed in the designation. To complete the fire order, the squad leader adds *fire at will*.

f. When the squad has completed firing, the squad leader commands: **CEASE FIRING, OPEN BOLTS**. The squad is taken forward to examine the target. The target panel is removed, scored, and marked with the squad number, and replaced with a new panel.

* * * * *

[A. G. 062.11 (12-3-35).] (1935.)

28. Scoring.—a. * * *

- (1) Number of rounds fired, **25**.
- (2) Value of each hit in 50 percent zone, **4**.
- (3) Value of each hit in 75 percent zone, **2**.

NOTE.—A satisfactory distribution of the ammunition is, automatic rifleman 7 rounds, riflemen 3.

* * * * *

[A. G. 062.11 (12-3-35).] (1935.)

29. Exercises.

* * * * *

c. Exercise No. 11.

* * * * *

(2) *Method*.—The instructor indicates three point targets to the squad leader, giving the nature of each. The squad leader applies the fire of his squad on the three targets in the proportions he believes appropriate. The scoring will be as for concentrated fire on each target, the several scores being combined in totals for the score of the exercise.

* * * * *

[A. G. 062.11 (12-3-35).] (1935.)

BY ORDER OF THE SECRETARY OF WAR:

MALIN CRAIG,
Chief of Staff.

OFFICIAL:

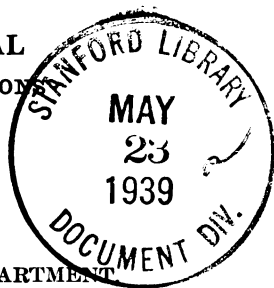
E. T. CONLEY,
Major General,
The Adjutant General.

N 3.63: 3rd 11/ chag. 6/ch. 2

BFM, Vol. III, Pt. One, Ch. 6

C 2

BASIC FIELD MANUAL
VOLUME III, BASIC WEAPON
PART ONE
RIFLE COMPANY
CHAPTER 6
MUSKETRY



CHANGES }
No. 2 }

WAR DEPARTMENT
WASHINGTON, January 3, 1939.

Basic Field Manual, Volume III, Part One, Chapter 6, March 1, 1932, is changed as follows:

34. Moving targets.—a. Vehicles.—(1) General.—Rifle units will be trained to engage large moving targets such as enemy tanks, armored vehicles, and trucks at ranges of 500 yards or less. Rifle fire at armored vehicles at ranges greater than 500 yards is exceptional. It may be employed to drive off or harass unarmored vehicles. Rifle units will be indoctrinated in the principle that in the event of tank attack they must stand their ground, take cover, and deliver the maximum possible aimed fire with armor-piercing or ball ammunition at the enemy tanks and at enemy foot troops which may accompany or support them.

(2) Leads.—The basic principles involved in firing at moving targets are simple. Targets which cross the line of sight at any angle are classified as crossing targets. In firing at targets which cross the line of sight the firer must aim ahead of the target so that the paths of the moving target and bullet will meet. Such aim, taken ahead of the target, is called the lead and is applied in target lengths. In fire directed at targets which cross the line of sight at ranges of 500–100 yards, a lead of two target lengths is used. If the target crosses at ranges of less than 100 yards, aim is taken at the forward edge of the target. Targets which approach directly toward the firer or recede directly from the firer, will, for all practical purposes, meet the bullet on its path and are classified as *no lead targets*.

BASIC FIELD MANUAL

(3) The technique of fire for the rifle and for the Browning automatic rifle does not depend upon tracer ammunition or observation of strike. It is necessary that the individual rifleman or automatic rifleman be able to keep his fire on his target without assistance and the technique contained herein is based on this principle. Individuals must be trained to deliver a rapid and accurate fire and to sustain their fire by rapid reloading.

(4) *Technique of fire at moving ground targets.*—(a) Fire is opened at ranges of 500 yards or less.

(b) With the U. S. rifle M1903 (Springfield) the battle sight is used. Weapons without a battle sight use a setting of 300 yards.

(c) On approaching or receding targets the firer holds his aim on the center and squeezes off his shot.

(d) At crossing targets the firer alines his sights on a point behind the target and swings his aim through the center to a lead of two target lengths in front of the target. The rifle is kept swinging and the shot squeezed off when the proper lead is reached. If the target is within 100 yards he maintains his aim on the forward edge.

(e) Firing is as rapid as proper aiming will permit.

(f) With the Browning automatic rifle equipped with bipod and hinged butt plate, when the firer is in the prone position, automatic fire in bursts of 5 to 10 rounds may be used. When the firer is not in the prone position or when armed with the Browning automatic rifle without bipod and hinged butt plate, semiautomatic fire (rapid single shots) should be used.

(5) *Fire distribution.*—(a) In general the rifleman and automatic rifleman of front line units will engage the leading elements of approaching targets during tank attacks. Leaders must be careful to insure that sufficient fire is also directed on enemy foot troops or weapons which may accompany or support such attack.

(b) Leaders will be especially alert to direct fire on new targets appearing in the foreground or on the flanks. Whenever possible, squad leaders will designate targets and direct the fire of their units.

BASIC FIELD MANUAL

(c) Individuals will be trained to open fire on sudden targets without waiting for command. Fire will ordinarily be maintained on the selected target until it is obviously disabled or destroyed, until a more dangerous target appears, or until fire on a new target is ordered.

(d) All men will be trained to switch their fire from distant targets to dangerous targets which appear suddenly at close range.

(6) *Place in training.*—(a) Moving target firing is an integral part of the firing at field targets (sec. VII) prescribed for the soldier's training in musketry. As such, it follows his instruction in marksmanship and in the subjects covered in sections I to VI, inclusive, in musketry.

(b) Wherever possible, and especially in mobilization training, moving target firing will be conducted on suitable ranges with service ammunition as an essential part of the unit's firing at field targets (sec. VII). Such work should be preceded by a brief period of instruction in the technique of fire involved and in the local range and safety requirements. This instruction should preferably be given at the scene of the field firing and constitutes all of the specialized preliminary training necessary for excellent results in moving target firing.

(c) Moving target firing with service ammunition may be undertaken by small units or by units as large as the platoon. It is not executed by individuals.

(d) When time and ammunition allowances permit, 1,000-inch moving target firing and other more extensive preliminary instruction may be included in training schedules. Advantage may be taken of indoor ranges and caliber .22 firing to impart instruction in this subject. In general, the instructional material contained in Basic Field Manual, Volume III, part four B, and especially in section IV thereof, will be found useful for training in firing at moving targets.

(7) *Targets and ranges.*—(a) The targets and ranges shown in section IX of Basic Field Manual, volume III, part four B, are suitable for the use of rifle units in their field firing at moving targets.

b. *Personnel.*—Firing at personnel as moving targets with either the rifle or automatic rifle presents a simple problem

BASIC FIELD MANUAL

in field firing and is covered by the following general rule: When firing at a man walking across, or at right angles, to the line of fire the points of aiming at the various ranges are as follows:

- (1) At 100 yards, aim at forward half of body.
- (2) At 200 yards, aim at forward edge of body.
- (3) At 300 yards, lead him one-half the width of his body.
- (4) At 400 yards, lead him the width of his body.

[A. G. 062.11 (2-11-38).] (1938.)

BY ORDER OF THE SECRETARY OF WAR:

MALIN CRAIG,
Chief of Staff.

OFFICIAL:

E. S. ADAMS,
Major General,
The Adjutant General.

13.63:3 pt 2

WAR DEPARTMENT

BASIC FIELD MANUAL



Volume III
BASIC WEAPONS

PART TWO
FIRE-CONTROL INSTRUMENTS

BASIC FIELD MANUAL



Volume III BASIC WEAPONS

PART TWO FIRE-CONTROL INSTRUMENTS

**PREPARED UNDER DIRECTION OF THE
CHIEF OF INFANTRY**

1932



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932**

For sale by the Superintendent of Documents, Washington, D. C.

WAR DEPARTMENT,
WASHINGTON, May 2, 1932.

Part Two (Fire-control Instruments), Basic Field Manual, Volume III (Basic Weapons), is published for the information and guidance of all concerned.

[A. G. 062.11 (4-13-31).]

BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,

*General,
Chief of Staff.*

OFFICIAL:

C. H. BRIDGES,
*Major General,
The Adjutant General.*

II

LIST OF FIELD MANUALS

A MANUAL FOR COMMANDERS OF LARGE UNITS. (M. C. L. U.)

- Vol. I. *Operation*.—A guide for commanders and staffs for tactical operations of large units.
- II. *Administration*.—A guide for the administration of large units in a theater of operations.

STAFF OFFICERS' FIELD MANUAL. (S. O. F. M.)

Staff principles and functions applicable to the staffs of all units, together with pertinent reference data.

BASIC FIELD MANUALS. (B. F. M.)

Training, administrative and reference data applicable to more than one arm, with special reference to the smaller units.

- Vol. I. *Field Service Pocketbook*. (F. S. P.).—The individual.
- II. *Infantry Drill Regulations*. (I. D. R.).—Drill, dismounted ceremonies and inspections; the infantry pack, display of equipment, and tent drill.
- III. *Basic Weapons*. (B. W.).—Marksmanship and mechanical training of the rifle, automatic rifle, pistol, machine gun, 37-mm. gun, 3-inch trench mortar, bayonet and grenade instruction. Technique of fire (37-mm. gun, 3-inch trench mortar and machine gun); musketry and combat practice of small units, instruments.
- IV. *Signal Communication*. (S. C.).—Signal regulations and technical information needed by officers and enlisted men on signal communication duty of arms other than the Signal Corps.
- V. *Transport*. (T.).—Equitation, training remounts, use and care of animals and of animal-drawn, pack, motor and tractor transport.
- VI. *Administrative Regulations*. (A. R.).—Army Regulations essential to small units.
- VII. *Military Law*. (M. L.).—The Manual for Courts-Martial, including the Articles of War; the Rules of Land Warfare, including recent conventions relative to the sick and wounded of armies in the field and to prisoners of war; an epitome of the legal principles applicable to military forces when aiding the civil power.
- VIII. *Operations of Combined Arms (Small Units)*. (O. C. A.).—The principles, doctrines, and methods governing the tactical employment of combined arms with reference to the small units.

FIELD MANUALS FOR THE ARMS

The manual for each arm contains, primarily, the principles, doctrines, and methods governing the employment of that arm and pertinent reference data.

Infantry Field Manual. (I. F. M.)

- Vol. I. *Units other than Tanks.*
II. *Tank Units.*

Cavalry Field Manual. (C. F. M.)**Field Artillery Field Manual. (F. A. F. M.)**

- Vol. I. *Organization and Drill.*
II. *Tactics and Technique.*

Coast Artillery Field Manual. (C. A. F. M.)

- Vol. I. *Harbor Defense, Railway and Tractor-drawn Units.*
II. *Antiaircraft Artillery Units.*

Air Corps Field Manual. (A. C. F. M.)**Engineer Field Manual. (E. F. M.)**

- Vol. I. *Engineer Troops.*
II. *Military Engineering.*

Signal Corps Field Manual. (S. C. F. M.)

- Vol. I. *Signal Corps Troops.*
II. *Signal Corps Operations.*

FOREWORD

Basic Field Manual, Volume III, Basic Weapons, will be published in six parts as follows:

PART ONE. Rifle company. (Each chapter of Part One will be published as a separate pamphlet.)

- Chapter 1. Rifle marksmanship.
2. Automatic rifle marksmanship.
 3. Automatic pistol marksmanship.
 4. Instruction with the bayonet.
 5. Instruction with hand and rifle grenades.
 6. Musketry.

PART TWO. Fire-control instruments.

- Chapter 1. Machine-gun instruments.
2. 37-mm. gun and 3-inch trench mortar instruments.
 3. Care, repair, and adjustment of instruments.

PART THREE. Machine-gun company.

- Chapter 1. Mechanical training with the machine gun.
2. Machine-gun marksmanship.
 3. Technique of machine-gun fire.
 4. Barrages and concentrations.

PART FOUR. Howitzer company.

- Chapter 1. Mechanical training with the 37-mm. gun and the 3-inch trench mortar.
2. 37-mm. gun and the 3-inch trench mortar marksmanship.
 3. Technique of the 37-mm. gun and the 3-inch trench mortar fire.

PART FIVE. Combat practice firing.

- Chapter 1. General.
2. Rifle company.
 3. Machine-gun company.
 4. Howitzer company.

PART SIX. Antiaircraft marksmanship—Infantry weapons.

- Chapter 1. General.
2. Rifle and automatic rifle.
 3. Machine gun, caliber .30.

TABLE OF CONTENTS

	Paragraphs	Pages
CHAPTER 1. Machine-gun instruments.....	1-7	7-42
2. 37-mm. gun and 3-inch trench mortar instruments.....	8-11	43-49
3. Care, repair, and adjustment of instru- ments	12-13	50-52

BASIC FIELD MANUAL, VOLUME III

BASIC WEAPONS

PART TWO

FIRE-CONTROL INSTRUMENTS

CHAPTER 1

MACHINE-GUN INSTRUMENTS

	Paragraph
Aiming circle, M1916.....	1
Angle-of-site instrument, M1917.....	2
Field glass, type EE.....	3
Lensatic compass, M1918.....	4
Machine-gun clinometer, M1917.....	5
Range finders.....	6
Sitogoniometer.....	7

1. **Aiming circle, M1916.**—The aiming circle, M1916 (fig. 1), complete, consists of the aiming circle, tripod, and carrying cases. It was designed for the Field Artillery. While certain changes must be made before this instrument is ideal for machine-gun use, it is of considerable value even in its present form.

a. Description.—The aiming circle consists of two major parts: A compass box rigidly secured to a cylindrical stem, and an operating group mounted on a collar by means of which the group may be rotated about the cylindrical stem on which the compass box is fixed.

(1) The compass box contains a compass needle. A needle-release button (2) is provided for raising or lowering the needle on the pivot and can be held down, to permit the needle to function, by rotating the needle-release button holder (1). A spherical level (3) is housed in the raised portion of the needle-release mechanism. The lower half of the compass box is graduated into 64 equal spaces numbered from 0 to 64; each space represents 100 mils of horizontal angle. The scale formed by these graduations is known as the azimuth circle (9). The north compass index is opposite 32 and the south index opposite 0, on the azimuth circle. A second series of numbers, from 0 to 31, inclusive, may be found above the main

scale between the 32 and 64 graduations. This upper series may be disregarded for machine-gun use.

(2) The operating group, which includes the azimuth mechanism, angle-of-site mechanism, and the telescope, is geared to the cylindrical stem on which the compass box is mounted. The group may be disengaged from the stem by holding out the throw-out lever; this permits free rotation of the group about the stem. Slow motion of the operating group with respect to the compass box can be obtained by turning the azimuth knob (11).

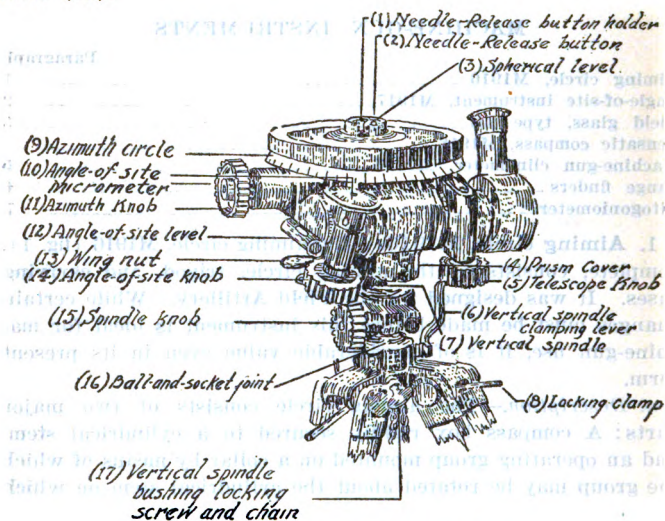


FIGURE 1.—Aiming circle, M1916

- (a) 1. The azimuth mechanism includes a worm (geared to a wheel on the compass box stem), an azimuth knob, an azimuth circle index, and an azimuth micrometer. The last is graduated into 100 equal spaces, each representing one mil, numbered from 0 to 100. One complete turn of the azimuth knob advances the azimuth circle index one space, or 100 mils, on the azimuth circle.
2. The aiming circle, when placed on the tripod spindle, can be turned in azimuth, as a unit. If

the wing nut (13) is loosened, the assembly can be turned freely; if the wing nut is clamped, slow motion in azimuth of the entire assembly can be had by turning the spindle knob (15).

3. Thus it is evident as indicated above that the aiming circle can be turned in azimuth as a unit, or the operating group can be moved independently of the compass box and also independently of the azimuth circle. This rotation of the operating group, including as it does the telescope and the azimuth mechanism, with respect to the azimuth circle, is the basis of the use of the instrument as an azimuth or horizontal-angle measuring instrument.

- (b) 1. The angle-of-site mechanism consists of a bubble level (12), the angle-of-site knob by which the bubble is leveled (14) and angle-of-site scale, and an angle-of-site micrometer (10). The angle-of-site scale is graduated into six equal parts, each representing 100 mils of vertical angle. The micrometer is divided into 100 equal spaces, each representing one mil, and numbered from 0 to 100. One complete turn of the micrometer moves the angle-of-site index one space, or 100 mils, on the scale.
2. The angle-of-site scale, as designed for field artillery use, is graduated so that when the angle-of-site to an object at the same level as the instrument is read, the reading of the scale and micrometer is 300.
3. The angle-of-site mechanism is directly connected with the telescope. If the latter is turned by rotating the telescope knob (5) the angle-of-site mechanism is moved through the same angle that the line of aim is moved. When the line of aim is properly directed at an object not at the same elevation as the instrument, the line of aim is at an angle to the horizontal and the bubble level is inclined at the same angle to the horizontal. Hence, when the bubble is releveled, the angle-of-site mechanism has measured this angle, and the angle-of-site scale and the micrometer indicate the angle of site of the object with respect to the instrument.

(3) The telescope is a 4-power instrument with a somewhat limited field of view. Consequently, it is not suitable for the

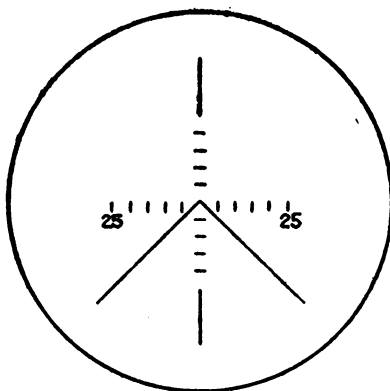


FIGURE 2.—Reticule graduations, aiming circle, M1916

observation of machine-gun fire. It is used merely to direct accurately the line of aim on an object when measuring vertical or horizontal angles. For this purpose, a graduated glass, called a "reticule," is provided in the optical system of the telescope. There are two types of reticule graduations. The reticules of the older M1916 aiming circles are graduated as shown in

Figure 2. Each horizontal and vertical graduation measures 5 mils. The instruments of later manufacture have a reticule showing a vertical mil scale and a stadia scale. (Fig. 3.) The optical center is marked by a cross. The vertical mil scale is graduated at 5-mil intervals. The stadia scale has no useful application in machine-gun work and may be disregarded.

(4) The eyepiece tube is fitted with a glass window opposite the reticule for illuminating it when used at night.

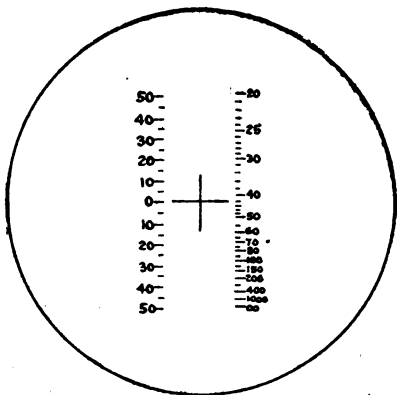


FIGURE 3.—Vertical mil and stadia scale, aiming circle, M1916

(5) The tripod is of the extension type, provided with locking clamps (8) for each leg. At the top of the tripod a vertical spindle is mounted with a ball-and-socket joint (16); the spindle

can be turned in azimuth by turning the spindle knob. The vertical spindle bushing locking screw (17), when screwed in tightly, prevents the spindle and its bushing from being pulled out of the tripod.

(6) When not in use the aiming circle is carried in a leather case, mounted therein on a removable metal plate which has a vertical spindle similar to the one on the tripod.

b. Use.—The aiming circle is used to measure horizontal and vertical angles.

c. To set up the instrument.—Open and extend the tripod legs to the desired height, clamp them by means of the locking clamps, and embed the legs firmly in the ground. Place the aiming circle on the tripod spindle and clamp with the wing nut. Level by means of the ball-and-socket joint and the spherical level. Then clamp by means of the vertical spindle-clamping lever (6). Rotate the prism cover upward to expose the objective prism.

d. To measure the horizontal angle between two objects.—Set the azimuth circle index and azimuth micrometer to read zero. Release the wing nut and rotate the entire aiming circle until the telescope is approximately directed on the first object; retighten the wing nut. Then, by means of the spindle knob, bring the optical center of the telescope reticule exactly on the first object. It may be necessary to raise or lower the optical center in order to get it on the object; this is done by turning the telescope knob. Hold out the throw-out lever and turn the operating group about the vertical stem of the compass box until the telescope is pointed approximately at the second object; release the throw-out lever; then, by turning the azimuth knob, bring the optical center mark exactly on this object. The reading of the azimuth circle and micrometer will give the angle, expressed in mils, between the two points. Horizontal angles should be read in a clockwise direction; if an angle is read counterclockwise, the reading must be subtracted from 6,400.

NOTES.—1. In this method it is not necessary to obtain separately the azimuths of the two points and then calculate the angle, as is necessary with the compass.

2. This procedure may be used in indirect laying of machine guns to measure the angle between the gun and target, as seen from an observation post.

e. To measure the magnetic azimuth to a point.—(1) First, orient the aiming circle on magnetic north as follows: Rotate the needle-release button holder until the needle-release button is held down, permitting the needle to swing freely. Set the azimuth circle and micrometer to read 0 and loosen the wing nut. Rotate the aiming circle until the north end of the needle points approximately to the north index on the compass box. Tighten the wing nut and, by turning the spindle knob, bring the needle and index to exact coincidence. The 0-3,200 line of the azimuth circle now points to the magnetic north and the aiming circle is oriented.

(2) Next, disengage the throw-out lever and rotate the operating group until the telescope is pointed approximately at the object. Release the throw-out lever and bring the optical center of the reticule exactly on the object by rotating the azimuth knob and the telescope knob. The azimuth is then read from the azimuth circle and azimuth micrometer.

(3) This procedure has application in indirect laying in measuring the angle between the gun and target, as seen from an observation post, when the guns must be laid by azimuths.

f. To measure the angle of site to an object.—Proceed as prescribed in *e* above, except that the optical center of the reticule is directed on the base of the object. Next, rotate the angle-of-site knob until the angle-of-site level bubble is midway between the graduations on the level vial. Read the angle-of-site scale and micrometer. When the angle is actually zero, the reading of the scale and micrometer is 300. Hence, angles below the horizontal are indicated by readings between 0 and 300 mils, and angles above the horizontal by readings between 300 and 600 mils. Since, however, in machine-gun practice, plus and minus angles of site are used, the instrument readings must be converted into plus and minus angles. For example, if the reading is 285, the angle of site is actually minus 15; if the reading is 320, the angle of site is actually plus 20.

g. To lay a gun for direction.—(1) The gun is laid for direction as described in Chapter 3, Part Three, Basic Field Manual, Volume III.

(2) It must be remembered that the compass of the aiming circle is affected when used near steel or iron. Hence, the instrument can not be used to measure azimuths when in close proximity to machine guns, nor can accurate results be obtained if the observer wears a steel helmet.

h. To declinate the aiming circle.—(1) *The declination constant.*—(a) The magnetic needles of all instruments having compasses vary in strength of magnetism because of the variations of manufacture, differences in age, and the amount of vibration received in use. This results in different readings with different instruments even when used under identical conditions. Hence, data determined with one magnetic instrument can not be accurately applied to the guns with another, unless corrections are made for the magnetic variations of the two.

(b) The horizontal angle between the grid north and magnetic north is called the map declination. It is the magnetic declination from the grid or map north. If magnetic north is east of grid the declination is positive, if west, it is negative.

(c) The individual deviation (compass error) of an instrument is the deviation of the compass of that particular instrument from magnetic north. If the individual deviation is to the east it is positive, if to the west it is negative.

(d) The declination constant is the algebraic sum of the map declination and the individual deviation of the instrument.

(e) Once a grid is placed on a map, grid north is invariable for that map. Therefore it may be taken as a standard to which the variable magnetic readings of compass-bearing instruments may be referred. Since the grid used on one map may not be the same as that on another, the declination constant can be used only with the particular map in connection with which it is determined, and it can be used only within a radius of 6 miles from the point at which it is determined.

(2) *To determine the declination constant.*—(a) Set up the instrument at some station from which can be seen three or four other points, the grid azimuths of which, from the declination station, can be determined from a map. One of these points should be at least 2,000 miles from one of the other points. Orient the aiming circle and measure the magnetic azimuths to the selected points. Throw off the orientation of the instrument, reorient it, and take another series of readings to the same points. Take a third series of readings. Obtain the average difference between these magnetic azimuths and the corresponding grid azimuths. This average difference, which includes both the map declination and the individual deviation of the instrument, is the declination constant of that instrument.

(b) If the magnetic azimuths are greater than the grid azimuths, the declination constant must be subtracted from the magnetic azimuth in order to convert the reading to grid azimuth. The sign of the constant, therefore, is minus. Similarly, if the magnetic azimuths are less than the grid azimuths, the sign of the constant is plus.

(3) *Application of the declination constant.*—(a) To convert from a magnetic reading to a grid azimuth, add algebraically the declination constant of the instrument which was used to obtain the reading. The result is the grid azimuth of the line along which the reading was taken.

(b) To convert from a grid azimuth to the corresponding magnetic reading for a particular instrument, change the sign of the declination constant for that instrument and add it algebraically to the grid azimuth.

(c) Each instrument should have attached to it a tag upon which is marked either the declination constant for that instrument or, better, the corrections necessary to convert from the magnetic reading to grid azimuth and from grid to magnetic.

(d) When data for indirect laying are determined by the TOG method (Ch. 3, Pt. Three, B. F. M., Vol. III), unless the declination constants of the compasses and aiming circles are known, the same instrument must be used in laying the guns as was used in determining the required magnetic azimuths. If the constants of all instruments in the company are known, time and labor may frequently be saved by determining the data with one instrument and laying the guns with another. In this event the magnetic azimuths determined with the first instrument must be converted to grid azimuths. When the guns are laid with a second instrument the grid azimuths are converted back to magnetic azimuths. The magnetic azimuths thus found will give the same results as would have been obtained had the first instrument been used both to obtain the azimuths and lay the gun.

i. Adjustments.—(1) To adjust the azimuth micrometer, rotate the azimuth circle until the index exactly coincides with a graduation; loosen the azimuth-micrometer locking screw; turn the micrometer until the 0 coincides with the index; tighten the screw.

(2) The angle-of-site scale and micrometer are set in the shop so that, when the index indicates 3 and the micrometer 0,

the line of site is horizontal. To adjust the angle-of-site micrometer, set the index to coincide accurately with the 3 graduation; loosen the angle-of-site micrometer-retaining screw; turn the micrometer until the 0 coincides with the index; then tighten the screw. To insure that the angle-of-site mechanism is in correct adjustment, angles of site should be read in both directions between two points not on the same level and at a distance of at least 200 yards from each other. The readings should be taken with the aiming circle assembly set up at the same height for each reading. If the positive and negative readings are equal the angle-of-site mechanism is in correct adjustment; if they are not equal the error for which correction should be made is one half the difference between the positive and negative readings. *Example*: If the positive angle of site is plus 4 and the negative angle of site is minus 10, the correct readings are plus 7 and minus 7, respectively (the mean of the positive and negative readings), the angle-of-site error is minus 3, and to correct readings made with the instrument 3 mils must be added to any reading taken. If it is desired to adjust an instrument having a small error so that it will read the correct angle of site, set off the error on the angle-of-site scale and micrometer; loosen the angle-of-site micrometer-retaining screw; turn the micrometer until the 0 coincides with the index; then tighten the screw. This correction should then be checked by reading known angles. If the error is large, the instrument should be turned in to the ordnance officer for repairs. When the instrument is not adjusted to correct for the error, the necessary correction should be entered on the tag mentioned in *h(3)(c)* above.

(3) Backlash in the operating worm of the throw-out lever can be removed by adjusting the screw plug which controls the plunger spring.

j. Care and preservation.—(1) When using the throw-out lever, care should be taken to rotate it sufficiently to prevent the worm from scraping over the teeth on the worm wheel; otherwise, these teeth will eventually be damaged enough to cause inaccurate readings.

(2) Before inserting the aiming circle in its carrying case, cover the objective prism by rotating the prism cover (4) downward. Raise the compass needle from the pivot by rotating the needle-release button holder until the needle-release button

is free. Care should be taken that the vertical spindle does not become damaged in any way. Before returning the tripod to its case, be sure that the upper leg clamps are moved well into the recess to avoid catching on the case in removal.

(3) When the M1916 instrument is carried with the machine-gun company, the tripod can be carried by strapping it on top of the tool box of the gun cart with two short straps; these can easily be fastened to the box for that purpose. The aiming circle should be transported where it will be best protected from injury.

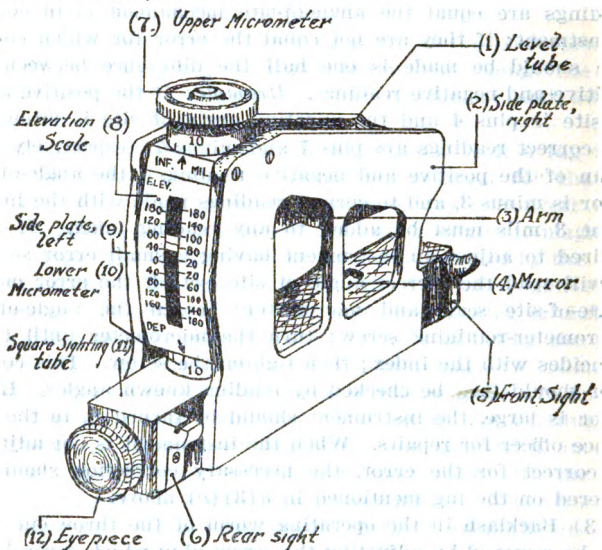


FIGURE 4.—Angle-of-site instrument, M1917

2. Angle-of-site instrument, M1917.—The angle-of-site instrument, M1917 (fig. 4), complete, consists of the angle-of-site instrument and its carrying case.

a. Description.—(1) The angle-of-site instrument consists of a square sighting tube (11) mounted between two side plates (2) and (9), one of which carries a pivot upon which the arm (3) carrying the level tube (1) rotates. The sighting tube contains an opening directly beneath the level through which the image of the level passes onto an inclined mirror (4) which reflects the image into the eye through a small hole in the eyepiece (12) of the telescoping sighting tube.

(2) A horizontal wire is fastened to the mirror carrier inserted into the front end of the sighting tube in such a manner that a line when passing through the small hole in the eyepiece and intersecting the wire is parallel to the lower surface of the sighting tube.

(3) Open sights (5) and (6) fastened to the right-hand side plates are provided for rapidly locating the target.

(4) The arm carrying the level is actuated by rotating the upper micrometer (7). The rear end of the arm is fitted with an index which registers against the elevation scale fastened between the side plates.

(5) The elevation scale (8) is graduated in 20-mil intervals, 180 mils above and below the zero or normal graduation. Graduations above the zero are indicated by black figures, below zero by red.

(6) The micrometers are graduated into 20 equal spaces, each representing 1 mil and numbered every five spaces from zero to 20. One turn of the micrometer advances the index on the arm one space, or 20 mils, on the elevation scale which corresponds to the number of graduations on the micrometer.

(7) The upper micrometer is used in conjunction with the graduations above the zero and the lower micrometer (10) with those below the zero.

b. Use.—The angle-of-site instrument is used to measure vertical angles with reference to the horizontal, such as angles of site and angles of slope. It can also be used as a clinometer for laying machine guns or for determining the elevation of a gun when laid.

c. To measure the angle of site to an object.—(1) Pull out the telescoping sighting tube and set the arm index at the approximate angle to the object. Grasp the instrument firmly in both hands, the thumb and forefinger of one hand on the knurled surface of the upper micrometer. Line up the open sights with the object, look through the small hole in the eyepiece and bring the horizontal wire accurately upon the object, then rotate the upper micrometer until the bubble is central with the horizontal wire and note the reading on the elevation scale and the micrometer. If the index is between graduations, the numerically lower one should be noted. Add to this the number of mils as indicated on the proper micrometer. The angle is positive if the index is above the zero, negative if below.

(2) More accurate results are obtained by taking the mean of several readings. A rest for the instrument or for the elbows facilitates the operation.

d. To lay the gun.—Set the index and micrometer at the desired settings and place the instrument on a straight portion of the gun which is parallel to the bore, such as the top of the right side plate, then bring the bubble midway between the lines on the level vial by elevating or depressing the gun. This is an auxiliary use of the instrument.

e. To measure the angle of elevation.—The gun having been laid, place the instrument on a straight portion of the gun parallel to the bore and rotate the upper micrometer until the bubble is midway between the lines on the level vial, then note the reading.

f. To test the instrument.—(1) To test the angle-of-site instrument, read the angle of site from one point to a second, then from the second to the first, being careful when aiming at each to aim at exactly the position where the eye was or will be when aiming from that point. Suppose that the reading from the first to the second is 21-mils depression; then the reading from the second to the first point should be 21-mils elevation. If, however, the reading from the second to the first point is 25-mils elevation, then the mean reading will be 23 mils. The instrument reads 21-mils depression when it should read 23, and reads 25-mils elevation when it should read 23, in other words, it reads 2 mils too high. The instrument may be used accurately by allowing for this error.

(2) To test the instrument for use as a clinometer, set the micrometer and index on the arm at zero and place the instrument on the gun. Elevate or depress the gun until the bubble is midway between the lines on the level vial. Reverse the instrument, end for end, and place it on the gun; note the position of the bubble in respect to the lines on the level vial. If either of the outer ends of the bubble are within one-sixteenth inch from its respective line, the adjustment of the level vial in respect to the zero settings is within the allowable error permitted. Determine the value of the error and allow when setting the instrument.

g. Adjustments.—(1) To adjust the lower micrometer, bring the index on the arm in line with a graduation, loosen the set screws and rotate the micrometer until the zero graduation coincides with the index mark, then tighten the screw.

(2) The upper micrometer can not be adjusted in the field as it is secured to the elevation screw by a taper pin.

(3) To adjust the level vial in respect to the zero settings, determine the error as described in *f* (2) above and loosen the lock nut and set screw on the side of the level holder, turn the level adjusting screw until the amount of the bubble error is halved, then reverse the instrument, end for end, and note the remaining error. Repeat the operation until the bubble remains midway between the lines, then tighten the lock nut and set screw. This will adjust for the error in angle-of-site readings unless the lower surface of the sighting tube is not parallel to a line through the hole in the eyepiece and the horizontal wire.

h. Care and preservation.—All parts should be kept clean, especially the aiming tube, eyepiece, and mirror carrier. To clean, remove the eyepiece, then pull the aiming tube to the rear as far as it will go; remove the mirror-carrier locking

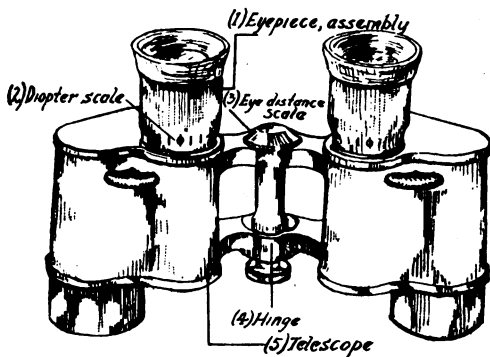


FIGURE 5.—Field glass, type EE

screws and remove the mirror carrier. Clean the base tube, aiming tube, and mirror with a soft cloth (a barrel-cleaning patch may be used if nothing better is available), using great care not to scratch the mirror.

3. Field glass, type EE.—The field glass, type EE (fig. 5), complete, consists of the field glass and its carrying case.

a. Description.—(1) The field glass consists of two compact prismatic telescopes (5) pivoted about a common hinge (4) which permits adjustment for interpupillary distances. A scale (3), graduated every 2 millimeters from 56 to 74, permits the observer rapidly to set the telescopes to suit his eye distance

when the spacing of his eyes is known. The eyepiece (1) can be focused independently for each eye by screwing in or out. Each is provided with a diopter scale (2) for rapid setting when the observer knows the correction for his eye. The zero graduations indicate the settings for normal eyes.

(2) The left telescope is fitted with a glass reticule (fig. 6) upon which are etched a vertical mil scale, a horizontal mil scale, and a stadia graduated similar to the sight leaf graduation on the service rifle.

b. Use.—The field glass is used for observations and the measurement of small horizontal and vertical angles in mils.

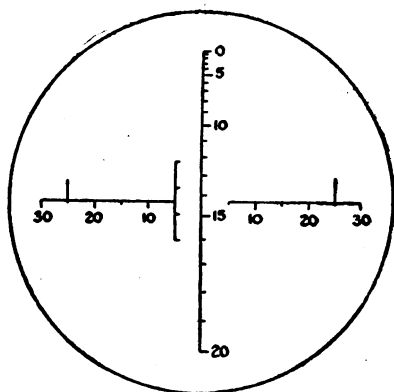


FIGURE 6.—Reticule graduations, field glass, type EE

The vertical stadia scale (inverted sight leaf) is used to pick up auxiliary aiming marks in direct laying and to determine troop safety for overhead fire.

c. Preliminary adjustments; interpupillary distance.—To adjust the glass so that the eyepieces are the same distance apart as the pupils of the observer's eyes, point the glass at the sky and open or close the hinged joint until

the field of view ceases to be two overlapping circles and appears to be one sharply defined circle. Note the reading on the scale (3), which indicates the spacing of the observer's eyes. The similar setting of any other field glass will then accommodate his eyes.

d. Focus of the eyepiece.—Look through the glasses, both eyes open, at an object several hundred yards away. Place the hand over the front of one telescope and screw the eyepiece of the other in or out until the object is sharply defined. Repeat this operation for the other eye then note the reading on the diopter scale. The similar setting of any other field glass will accommodate the eyes.

e. Operation.—(1) In using the glass it should be held in both hands and pressed lightly to the eyes so as to keep the relation

with the eyes constant without transmitting tremors from the body. The bent thumbs should fit into the outer edges of the eye sockets in such a manner as to prevent light from entering in rear of the eyepieces. When possible it is best to use a rest for the glass or elbows.

(2) The mil scales are seen when looking through the glass and, by superimposing them upon the required objects, the horizontal and vertical angles may be read between these objects.

f. Use of auxiliary aiming mark.—Where a target is invisible to the gunner or is exceptionally difficult to pick up, fire may

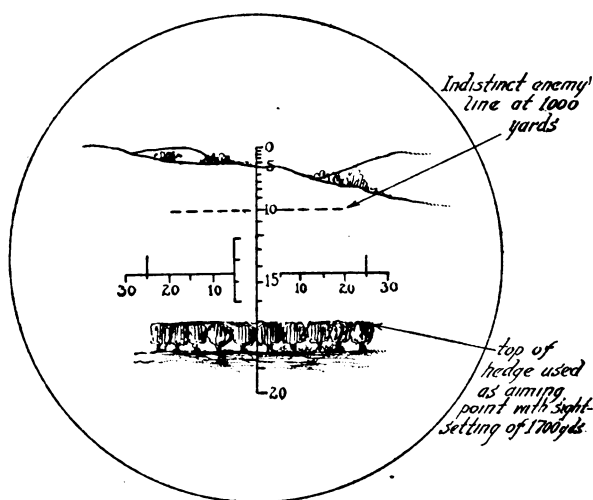


FIGURE 7.—Use of auxiliary aiming mark

often be directed by using an auxiliary aiming mark. The fire controller aligns on the target the graduation on the inverted sight leaf which corresponds to the range to the target. Keeping the glass in that position, he selects a clearly defined object in the vicinity of the target and notes the graduation on the scale opposite the object selected. Using this reading as the sight setting, and laying on the object selected as an auxiliary aiming mark, the strike will come at the target if the object is along the line gun-target. Similarly auxiliary aiming marks to the right or left of the target may be selected, and the proper amount of deflection may be set off on the wind gauge

of the rear sight or by means of the traversing dial. The inverted sight-leaf and mil methods may be combined for targets which are not directly above, below, to the right or to the left of the object selected as an auxiliary aiming mark.

g. Use of the field glass to determine troop safety for overhead fire.—(1) In addition to the use of the field glass in obtaining firing data and employing auxiliary aiming marks, the glass is highly valuable to a machine-gun officer in determining troop safety for overhead fire. The inverted sight leaf in the glass may be used, instead of the sight leaf of the gun, in applying either the gunner's rule or the leader's rule (pars. 159 and 160, Pt. Three, B. F. M., Vol. III). The application of these rules, using the field glass, is illustrated as follows:

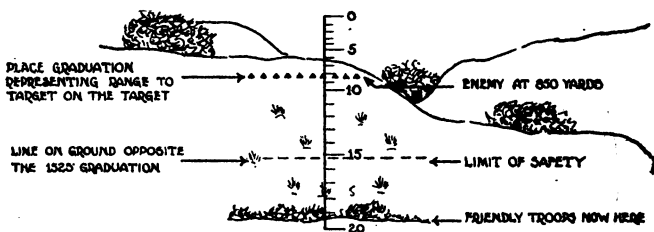


FIGURE 8.—Application of gunner's rule using inverted sight leaf in field glass

(a) *Gunner's rule.*—Range to target equal to or less than 900 yards.

1. Place the graduation of the glass representing the range to the target on the target.
2. Without changing the position of the glass note the line on the ground opposite the graduation for 1,525 yards.
3. If this line is short of the friendly troops it is not safe to fire; if it is beyond the location of friendly troops it is safe to fire on the target until the troops reach this line. (Fig. 8.)

(b) *Leader's rule.*—Range to target greater than 900 yards. (Fig. 9.)

1. Select a point on the ground to which it is believed friendly troops can advance with safety.
2. Accurately determine the range to this point.

3. Align, on the target, the graduation on the inverted sight leaf which corresponds to the range to the target.
4. Keeping the glass in that position, note the line on the ground opposite the graduation for 1,525 or for the range to the selected point plus 650, whichever is greater.
5. If this line does not clear the feet of the troops, it is not safe to fire.
6. If it strikes at the selected point, that point marks the limit of safety.
7. If it clears the feet of the troops and strikes short of the selected point, it is not safe for troops to advance to the selected point but is safe at least to the point where it strikes.

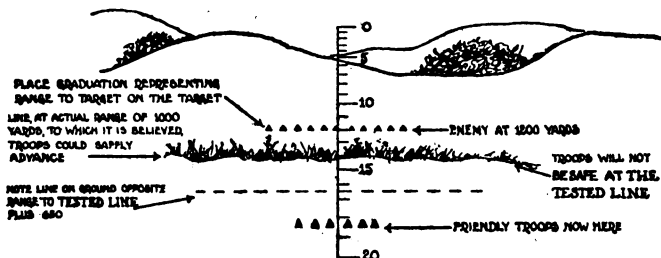


FIGURE 9.—Application of leader's rule using inverted sight leaf in field glass (showing case where selected point is not safe)

8. If it clears the selected point, it is safe for troops to advance at least to the selected point.
9. Continue to test points short or beyond the first selected point until the limit of safety is determined.

(2) This use of the field glass is especially applicable when reconnoitering for positions for machine guns when the guns are not yet in position. It must be understood that the safety limits should, where possible, be checked with the gun sights, as prescribed in paragraph 163, Part Three, Basic Field Manual, Volume III, before fire is opened.

h. Care.—The field glass is a rugged, serviceable instrument but should not be abused or roughly handled.

4. Lensatic compass, M1918.—The lensatic compass (fig. 10), complete, consists of the compass and its leather carrying case.

a. Description.—(1) The compass consists of a circular fluid tight box (15) containing a pivot, upon which is mounted a compass dial (9) visible through the glass top of the box and cover. Mounted on a projection of the box is a rear sight (11). The cover (2) hinged to the box forms the front sight and also protects the glass cover of the box. Under the inner edge of the azimuth circle (8), securing the glass top, is a night marching circle (10) free to rotate. The periphery of the lower portion of the box is graduated into 64 equal spaces, each representing an angle of 100 mils, numbered every 200 mils from 0 to 64 counterclockwise.

(2) The azimuth circle securing the window is similarly graduated and each 400-mils graduation beginning at zero or

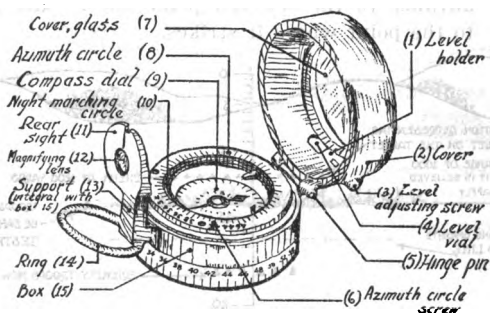


FIGURE 10.—Lensatic compass, M1918

64 is indicated by a dot of luminous paint. The 16, 32, 48, and 64 graduations, cardinal points of the compass, are especially indicated by an additional dot of luminous paint. Inside of the fluid chamber directly beneath the 64 graduation is the compass dial index.

(3) The night marching circle has a triangular-shaped index containing a luminous line. Directly opposite the index is a luminous dot. Another dot is placed at an angle of 600 mils from it. Two prongs bent upright are provided by which means the circle is rotated.

(4) The periphery of the compass dial is graduated into 160 equal spaces, each representing an angle of 20 mils and numbered every 200 mils from zero to 64 clockwise. It also contains an arrow, the point of which terminates at the 32 and 64

graduation. The north-seeking end of the arrow at the 64 graduation contains a luminous mark.

(5) The rear sight is hinged to the support (13) and the top portion contains a vertical slot for sighting. The center contains an opening fitted with a magnifying lens (12) for reading the fine graduations on the compass dial.

(6) Below the rear sight a ring (14) is mounted containing a niche, which is in line with the slot in the rear sight, the 32 graduation on the compass box and azimuth circle, the compass dial index, and the line forming the rear sight.

(7) The cover contains a glass top (7) upon which is etched a vertical line, forming the front sight. A level (4) is mounted in the cover parallel to the bottom of the compass box.

(8) The compass box is filled with a solution of 25 per cent glycerin and 75 per cent distilled water for damping the movement of the compass dial.

b. Use.—The chief uses of the compass in machine-gun work are the measurement of magnetic azimuths in the determination of indirect laying data and its actual laying of guns for direction by means of azimuths. It may also be used as a marching compass.

c. Operation.—(1) Open the cover to approximately the vertical position and fold back the rear sight until the graduations on the compass dial are clearly visible.

(2) If practicable, the compass should be rested on a level surface. It, however, can be read accurately when held in the hands, the ring between the thumb and forefinger of one hand, the other fingers closed, with the thumb and forefinger of the other hand grasping the compass box and the other fingers clasping the other hand, elbows close to the body or resting on the knees, depending on the position of the observer.

(3) While observing, the instrument should be held as nearly level as possible to permit the dial to swing free, otherwise errors in the readings will result.

d. To measure the azimuth from the observer to a given point.—Look through the slot in the rear sight so that the line on the cover appears to bisect the slot and is in line with the object, then note the reading on the dial through the magnifying glass.

e. To determine the back azimuth; that is, the azimuth of the position of the observer from a given point.—Read the azimuth

of the given point as described above. If the reading is less than 3,200 mils, add 3,200 to it; if over 3,200, subtract 3,200 from it.

f. To lay off a line of a given azimuth from the position of the observer.—Turn the compass until the dial index indicates the desired reading.

g. Given an azimuth to a given point, to find a position from which the given point is on that azimuth.—The observer places himself approximately on the required line, aims at the given point, then reads the dial. He then moves to the right or left while aiming at the given point until the given azimuth is indicated on the dial. Moving to the right decreases the reading, to the left increases it.

h. Given the azimuth from a given point, to find a position which is on that azimuth from the given point.—If the given azimuth is greater than 3,200 mils, subtract 3,200; if less than 3,200, add 3,200. The result is the azimuth of the given point from the required position, then proceed as in *g* above to find that position.

i. To determine the horizontal angle which two points subtend from the position of the observer.—Read the azimuth to each of the two points desired; subtract the smaller reading from the larger; if the difference is greater than 3,200 mils this difference must be subtracted from 6,400 to give the desired angle.

NOTE.—It is advisable to draw a rough diagram including one line for north and one for each of the two azimuths; the proper angle can then be determined without danger of confusion.

j. Operation at night.—(1) *To measure azimuth at night.*—The line of aim is established by the slot in the rear sight and the luminous mark on the inside of the cover. If practicable, the dial should be read by means of a flashlight, otherwise the dial is not readable and the readings are taken from the azimuth circle at the point of the luminous arrow by means of the night marching ring.

(a) Having aimed at a point, place the index line of the night marching ring coincident with the point of the luminous arrow on the dial. The reading (counterclockwise) in multiples of 400 mils is taken from the number of luminous dots from the 6,400 or zero point opposite the cover hinge.

(b) If the index on the night marching ring is between dots on the azimuth circle, the reading above the multiple of 400 is determined by means of the dots on the ring, as follows:

1. If the two dots on the ring overlap two dots on the azimuth circle by exactly equal distances, the reading at the index is 100 mils above the multiple of 400 mils obtained by the 400-mil dots.
2. If the dot on the ring nearest the index is coincident with a dot on the azimuth circle, the reading at the index is 200 mils above the multiple of 400 mils obtained by the 400-mil dots.
3. If the distance between the dots on the ring is exactly bisected by a dot on the azimuth circle, the reading is 300 mils above the multiple of 400-mil dots.
4. Readings closer than 100 mils must be estimated.

(2) *To lay off a line on a given azimuth.*—Set the index on the ring at the given azimuth on the azimuth circle; the compass is then turned until the luminous point of the arrow is coincident with the index. The line passing through the slot in the rear sight and the line on the cover will then be on the given azimuth.

(3) *To set the index on the night marching ring at a given azimuth.*—(a) If the given azimuth is a multiple of 400 mils, set the index to the proper dot on the azimuth circle, counting counterclockwise from the 6,400 point. If the given azimuth is not a multiple of 400 mils, set the index on the night marching ring to a dot on the azimuth circle corresponding to the multiple of 400 mils next below the given azimuth. If the azimuth is 100 mils above the multiple of 400 mils, move the ring counterclockwise until the dots overlap two dots on the azimuth circle by equal distances.

(b) If the given azimuth is 200 mils above a multiple of 400 mils, move the ring counterclockwise until the dot on the ring nearest the index is opposite a dot on the azimuth circle.

(c) If the given azimuth is 300 mils above a multiple of 400 mils, move the ring counterclockwise until the distance between the dots on the ring is bisected by a dot on the azimuth circle.

k. *To declinate the compass and to apply the declination constant.*—The method of determining the declination constant

is similar to that explained in paragraph 1h(2). The application of the declination constant is covered in paragraph 1h(3).

l. Adjustments.—No adjustments of the parts in the compass box are permitted in the field.

m. Care and preservation.—(1) The instrument contains a delicately pointed pivot and jewel and should be handled gently. Care should be taken to prevent damaging the glass covers.

(2) If bubbles appear in the fluid chamber, they can be removed by turning the compass upside down several times until they are trapped in the chamber provided for this purpose.

(3) If the bubble becomes too large, the chambers will be filled and a bubble will remain in the fluid chamber. The

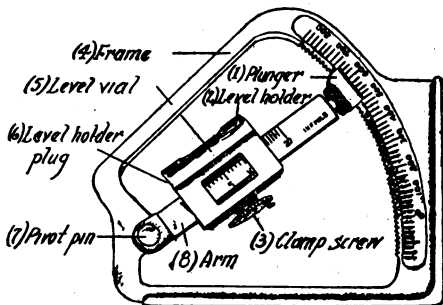


FIGURE 11.—Machine-gun clinometer, M1917

compass should not be used when bubbles appear in the fluid chamber as it will record inaccurately. Turn the compass in for repair at an arsenal.

5. Machine-gun clinometer, M1917.—The machine-gun clinometer (fig. 11), complete, consists of the clinometer and its carrying case.

a. Description.—(1) The clinometer consists of a sector-shaped frame (4) to which is pivoted a radial arm (8) which carries the level holder (2).

(2) The lower and rear edges of the frame are accurately machined so as to form a right angle. The sector-shaped or arc portion is notched and graduated every 20 mils, 840 mils above and 140 mils below the zero or normal graduation. Similar graduations are on each side of the frame.

(3) One end of the radial arm is pivoted to the frame, opposite the arc, while the other is fitted with a plunger (1) carrying an index, which engages the notches on the arc and which is held against the arc by a spring contained within the radial arm.

(4) Both sides of the radial arm are graduated into 20 equal spaces and numbered every 5 from zero to 20, each representing an angle of 1 mil when used in conjunction with the scales on the frame.

(5) The level holder slides along the curved top surface of the radial arm and carries the index marks used in conjunction with the scales on the sides of the radial arm and can be clamped in position by the clamp screw (3).

b. Use.—The machine-gun clinometer is for use in laying the machine gun in elevation or, when the gun is laid, for measuring its angle of elevation.

a. To lay the gun at a given elevation.—(1) If the given quadrant elevation is a multiple of 20 mils, set the index on the plunger opposite the proper graduation on the arc scale; set the index on the level holder at 0.

(2) If the given QE is not a multiple of 20 mils, set the index of the plunger opposite the graduation on the arc scale corresponding to the multiple of 20 next below the given QE; set the index on the level holder at the difference between this reading and the given QE. (For a QE of 73, set 60 on the arc scale and 13 on the radial arm.) Place the clinometer on a straight surface of the gun parallel to the bore, such as the top of the right side plate. If the muzzle of the gun is to be elevated, that is if the given quadrant angle of elevation is positive, the arc of the frame must be placed to the rear. If the muzzle is to be depressed, that is if the quadrant angle of elevation is negative, the arc must be to the front. Operate the elevating mechanism of the gun until the level bubble is midway between the lines on the level vial (5). Elevating the muzzle moves the bubble forward, depressing moves the bubble to the rear. The gun is now laid at an angle of elevation or depression equal to the setting of the clinometer.

d. To measure the angle of elevation.—The gun being laid, to measure the quadrant angle of elevation, place the clinometer on the gun with the arc to the rear if the muzzle is

elevated, and with the arc to the front if the muzzle is depressed. If in doubt as to whether the muzzle is elevated or depressed, set both indices of the clinometer at zero and place it on the gun. If the bubble is forward of center the muzzle is elevated, if to the rear, the muzzle is depressed. The clinometer being on the gun with the arc in the proper direction and the radial-arm index at zero, set the plunger index at the lowest reading in which the bubble will remain at the end of the level holder nearest the axis of the radial arm; then move the level holder toward the arc until the bubble is centered. The reading of the clinometer is the angle of quadrant elevation at which the gun is laid.

e. To test the clinometer.—To find the error of the clinometer, place it on any straight surface which is inclined not more than 40 mils from the horizontal. Set the arm and the level holder so that the bubble is centered and note the reading. Suppose the reading is 6 mils below zero (plunger index 20 below zero and level holder index at 14). Then having carefully marked the position of the clinometer, reverse it end for end, placing it on the same part of the surface. Again set the arm and level holder so that the bubble is centered. Suppose the clinometer now reads 2 mils above zero. Then the mean is plus or minus 4 mils; that is, the surface on which the clinometer was placed is inclined at an angle of 4 mils, elevation in one direction and depression in the other. The clinometer reads 6 mils below zero, when it should read 4 below, and 2 above when it should read 4 above, so that the clinometer has an error of minus 2 mils. To put any given quadrant angle of elevation on the gun, the clinometer should be set so that the graduations read 2 mils less, numerically, than the given quadrant elevation whether that quadrant angle of elevation is actually elevation or depression; that is, to put 22 mils elevation (plus 22 mils) on the gun the clinometer should be set at plus 20 and placed with the arc to the rear, and to put 22 mils depression (minus 22 mils) on the gun it should be set at 20 and placed with the arc to the front. On the other hand, if the clinometer has an error of plus 2 mils, the clinometer should be set so that the graduations read 2 mils more, numerically, than the given quadrant elevation whether that quadrant angle of elevation is actually elevation or depression; that is, to put 22 mils elevation on the gun, set the clinometer at 24 and place it on the gun with the arc to the

rear, and to put 22 mils depression on the gun, set the clinometer at 24 and place it on the gun with the arc to the front. To level the gun, the clinometer should be set at 2 mils below zero.

f. Care and preservation.—(1) Special care should be exercised to prevent burring, nicking, or denting the toothed portion of the arc, the curved top surface of the radial arm or the fiducial surfaces of the bases on the frame.

• (2) The clinometer should always be removed from the gun before firing.

6. Range finders.—*a. General.*—The range finders now in the Infantry are of three types. They differ from each other in con-

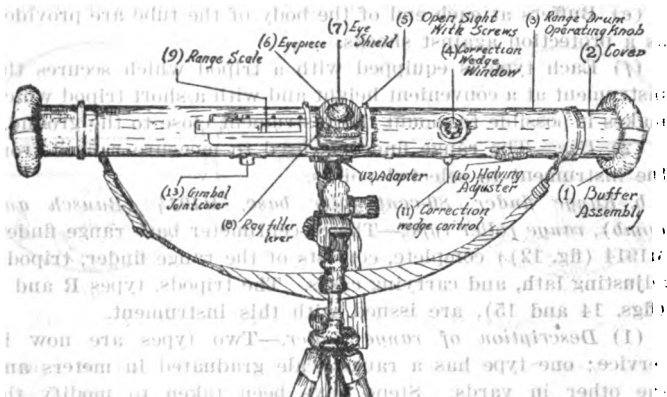


FIGURE 12.—Range finder, 80-centimeter base, M1914, range roller type

struction, operation, and adjustment, but in many respects are similar.

(1) *Description.*—(a) All three types are of the horizontal base, inverted, coincidence type which determines range by a method of triangulation on the basis of a base line, 80 centimeters (31½ inches) in length, corresponding to the spacing of the objective windows.

(b) The optical systems are similar; they consist practically of two periscopes laid horizontally so that their objective prisms are spaced 80 centimeters apart, but having one common eyepiece. Before the two images enter the eye lens they pass through the ocular prism which is so arranged as to divide the field as shown in Figures 13, ② and 18, ②.

(c) The eyepiece can be focused by rotation or by a lever. A diopter scale is provided for rapid setting when the observer has once determined the correction for his eye. The zero mark indicates the setting for the normal eye.

(d) A ray filter holder containing a smoked and an amber glass is pivoted within the eyepiece and controlled by the knurled disk or ray filter lever near the eyepiece. The smoked glass is provided for observing into the direct rays of a searchlight or of the sun, and the amber glass is used to moderate exceptionally bright daylight or the reflection of the sun over water.

(e) Buffers at each end of the body of the tube are provided as a protection against shocks.

(f) Each type is equipped with a tripod which secures the instrument at a convenient height and with a short tripod which makes it possible to mount the instrument close to the ground.

(2) *Use.*—The range finder is used to measure ranges from the instrument to selected points.

b. Range finder, 80-centimeter base, M1914 (Bausch and Lomb), range roller type.—The 80-centimeter base range finder, M1914 (fig. 12) complete, consists of the range finder, tripods, adjusting lath, and carrying cases. The tripods, types R and S (figs. 14 and 15), are issued with this instrument.

(1) *Description of range finder.*—Two types are now in service; one type has a range scale graduated in meters and the other in yards. Steps have been taken to modify the range finders so that all the range scales will be graduated in yards.

(a) The object, when viewed through the eyepiece (6), appears in a circular field with a horizontal narrow band across its center upon which is seen the inverted image of the object ranged on. The lower edge of the band is the fiducial line which appears to separate the images and beyond which they do not pass. This line is known as the halving line. The portion of the object not intercepted by the band appears as an erect image. In Figure 13, ③ the images are shown when coincidence is secured and when the halving adjustment is correct. In Figure 13, ① and ②, the images are shown when the halving line is out of adjustment. To measure ranges accurately, the halving line must be in adjustment and coincidence secured as shown in Figure 13, ③.

(b) The open sight (5) mounted on top of the tube, to the right of the eyepiece, permits rapid training of the instrument on the object.

(c) The adapter (12) attached to the tube below the eyepiece serves as a means for attaching the range finder to the support on the upper portion of the small tripod. (Fig 12.)

(d) The adjusting lath consists of a metal strip upon which two vertical black lines are painted, the distance between which is the same as the distance between the optical axes passing through the windows of the range finder. This makes each lath peculiar to the range finder with which it is issued. It is serially numbered the same as the range finder and should

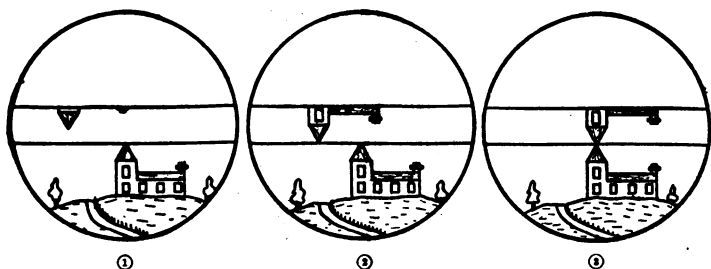


FIGURE 13.—Images, range finder, M1914, 80-centimeter base

always be kept with it. Adjustments should be made with none other. The sight, placed at the center, is for observing the center of the range finder when adjusting.

(2) *Description of tripod, type R (for range finders, 80-centimeter base, M1914 and 1917)* (fig. 14).—(a) The legs (3) of this tripod are constructed of wood and consist of one section.

(b) The upper ends are inserted under the tripod head (2) and are pivoted upon hardened steel balls.

(c) The lower ends are fitted with leg shoes (4) for embedding the legs into the ground.

(d) The protruding portion of the tripod head contains a hole for receiving the legs of the tripod, type S, and a clamp screw knob (1) is provided for clamping them at the desired height.

(e) A carrying case, attached to the side of the range-finder carrying case, is provided for the tripod.

(f) Care should be taken to prevent the denting of that portion of the tripod head containing the hole, as it will prevent the assembling of the short tripod.

(3) *Description of tripod, type S (short) (for range finders, 80-centimeter base, M1914 and M1917) (fig. 15).*—(a) This tripod is generally used in conjunction with the tripod, type R, except when using the range finder from entrench-

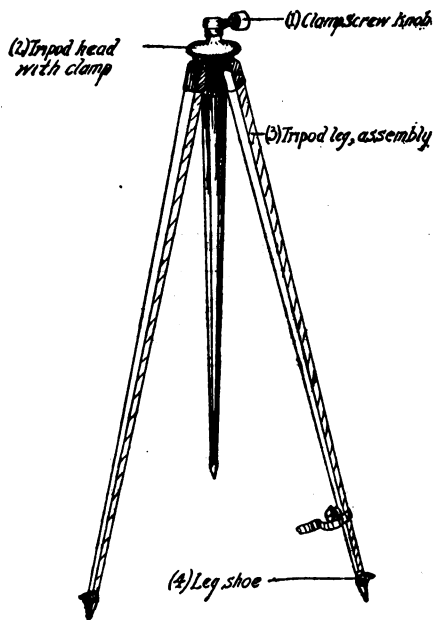


FIGURE 14.—Tripod, type R, for range finder

ments or when lying down, in which case the stem formed by the hinged legs (7) is withdrawn from the main tripod head, the legs spread and embedded in the ground.

(b) The legs are hinged under the head (6) and when folded form a cylindrical stem for inserting into the head of the tripod, type R.

(c) Loosening the head clamping knob (3) permits rotation of the range finder in azimuth. The mechanism above the head consists of an elevating and lateral tilting mechanism. Rota-

tion of the elevating knob (5) causes movement in elevation, and rotation of the tilting knob (2) causes movement laterally.

(d) The adapter (1) contains a spring catch (4) for use in securing the range finder to the tripod.

(e) The carrying case for the tripod is attached to the range-finder carrying case after the tripod is inserted.

(f) Care should be taken not to burr or mar the tripod legs, which will prevent their insertion into the tripod head.

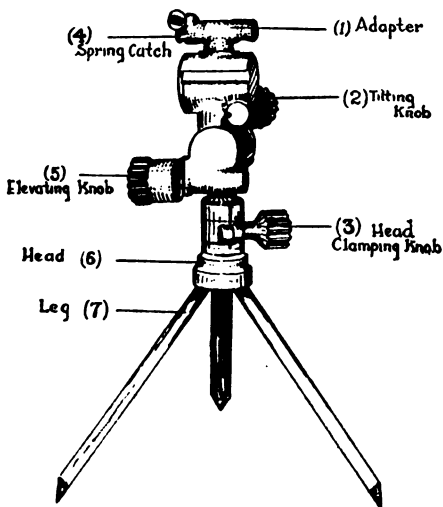


FIGURE 15.—Tripod, type S (short), for range finders

(4) *To set up the instrument.*—Spread the tripod legs and embed them firmly in the ground. Insert the legs forming the stem of the tripod, type S (fig. 15), into the tripod head (fig. 14) at the desired height and clamp by means of the clamp screw knob; then place the range finder on the mount.

(5) *To observe an object.*—(a) Using the open sight, roughly train the instrument on the object. Focus the eyepiece and bring the lower erect image in the center of the field by means of the elevating and tilting knobs. The images will appear as in Figure 13, ① and ②, when not in coincidence. To obtain coincidence, rotate the range drum operating knob (3) until the images appear as in Figure 13, ③. The range is that indicated on the range scale (9).

(b) The best defined part of an object should be selected to observe upon. Coincidence should preferably be made in the center of the field and, if possible, with the dividing line at right angles to the object observed. With targets moving laterally across the field, it is best to adjust the images near the edge from which the targets are moving and to make the coincidence while the targets move across the field.

(c) Ranges to objects with horizontal relief, such as roads, trenches, the horizon, etc., can be measured by removing the range finder from the mount and placing it vertically on one end.

(6) *Halving adjustment.*—To adjust the halving line, rotate the halving adjuster (10) until the images appear as in Figure 13, ②.

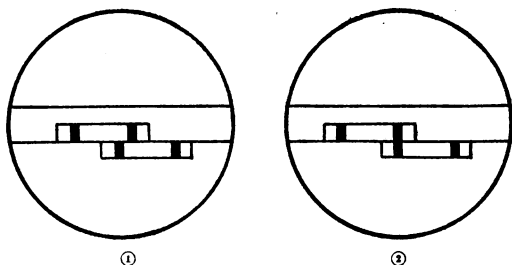


FIGURE 16.—Images, range finder, M1914, 80-centimeter base

(7) *Range adjustment.*—There are two methods of making adjustments for range; one is by the infinity method, the other the known range method.

(a) *Infinity method.*—Place the adjusting lath in a horizontal position about 200 yards or more from the instrument and set the range scale to indicate infinity. If the images appear as in Figure 16, ①, the instrument is out of adjustment and it is necessary to adjust the correction wedge by rotating the correction wedge control (11) until the images appear as in Figure 16, ②. Repeat the operation several times and note the reading on the correction scale through the correction wedge window (4). Set the correction scale at the average of these readings. In case the adjusting lath is not available, the moon may be used and the same procedure followed as described above. The sun should never be used as a target for adjusting

a range finder, because if the sun has sufficient power, the rays when in focus at the halving line will cause the balsam used in cementing the ocular prism to melt, thus causing injury to the optical system.

(b) *Known range method.*—Select some object at a medium distance, the range to which is known, and set the range scale to this range. If the images appear as in Figure 13, ① and ②, the instrument is out of adjustment and it is necessary to adjust the correction wedge by rotating the correction wedge control until the images appear as in Figure 13, ③. Repeat

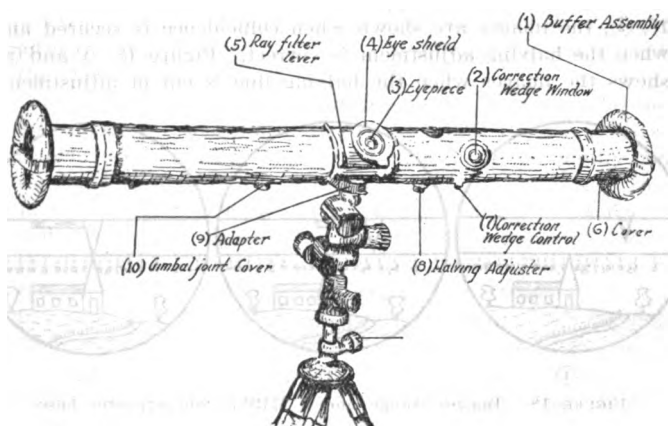


FIGURE 17.—Range finder, M1917, 80-centimeter base

this operation several times and note the reading on the correction scale through the correction wedge window. Set the scale at the average of these readings.

(c) *Range finder, M1917, 80-centimeter base (Bausch and Lomb), azimuth type.*—The 80-centimeter base range finder, M1917 (azimuth type) (fig. 17), complete, consists of the range finder, tripods, and carrying cases. The tripods, types R and S (figs. 14 and 15), are issued with this instrument.

(1) *Description.*—(a) The operation of this instrument is based upon the principle that an object, to be in coincidence, must occupy a predetermined horizontal position in the field of view.

(b) All range finders of this type were originally graduated in meters, from 400 to 10,000. Steps have been taken to modify them so that all the range scales will be graduated in yards.

(c) The objective when viewed through the eyepiece (3) appears erect in the lower portion of the field with a narrow horizontal band extending across its center on which is seen an inverted image of the object ranged on. The lower edge of the band is the fiducial line at which coincidence is made. This line, which separates the images and beyond which they do not pass, is known as the halving line. The portion of the object above the band appears as an erect image. In Figure 18, (3), the images are shown when coincidence is secured and when the halving adjustment is correct. Figure 18, (1) and (2), shows the images when the halving line is out of adjustment.

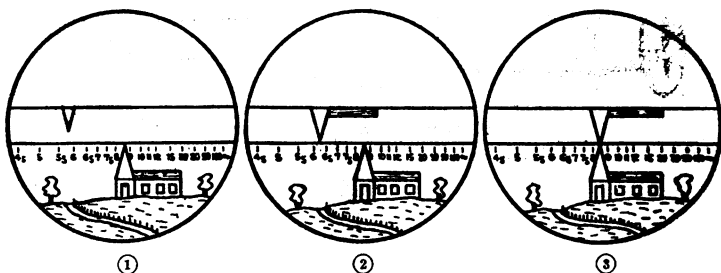


FIGURE 18.—Images, range finder, M1917, 80-centimeter base

(d) To measure ranges accurately, the halving line must be in adjustment and coincidence secured as shown in Figure 18, (3).

(e) The adapter (9) attached to the tube below the eyepiece is provided as a means for attaching the range finder to the support on the upper portion of the short tripod.

(2) *To set up the instrument.*—See b (4) above.

(3) *To observe an object.*—(a) Train the instrument approximately on the object, then look into the eyepiece and move the range finder, in azimuth, until perfect coincidence of the two images is obtained as in Figure 18, (3), the range indicated by the object at the point of intersection on the scale. Repeat this operation several times and take the average of these readings as the correct range.

(b) Ranges to objects with horizontal relief, such as roads, trenches, the horizon, etc., can be measured by removing the

range finder from the mount and placing it vertically on one end.

(c) The best defined part of an object should be selected to observe upon and coincidence should preferably be made with the dividing line at right angles to the object observed. With targets moving laterally across the field, it is best to start with the images near the edge from which the targets are moving and to make coincidence while the target moves across the field.

(4) *Halving adjustment.*—To adjust the halving line, rotate the halving adjuster (8) until the images appear as in Figure 18, ②.

(5) *Range adjustment.*—There are two methods of making adjustments for range; one is by the infinity method, the other the known range method.

(a) *Infinity method.*—Train the range finder on the moon and rotate the instrument in azimuth until the images are in coincidence. If the images do not coincide at the infinity mark, the instrument is out of adjustment, and it is necessary to adjust the correction wedge by rotating the correction wedge control (7) until the images coincide at the infinity mark. Repeat this operation several times and note the reading on the correction scale through the correction wedge window (2). Set the scale at the average of these readings. The sun should never be used as a target for adjusting a range finder because, if the sun has sufficient power, the rays when in focus at the halving line will cause the balsam used in cementing the ocular prism to melt, thus causing injury to the optical system.

(b) *Known range method.*—Select some object at a medium distance, the range to which is known, and rotate the instrument in azimuth until coincidence is secured. If the images do not coincide at the known range graduation on the scale, the instrument is out of adjustment and it is necessary to adjust the correction wedge by rotating the correction wedge control until the images coincide at the known range graduation. Repeat this operation several times and note the reading on the correction scale through the correction wedge window. Set the scale at the average of these readings.

d. Range finder, 80-centimeter base, M1918 (Keuffel and Esser), range roller type.—(1) *Description.*—For a description of this instrument see TR 1320-B.

(2) *Care and preservation.*—(a) All unnecessary turning of screws not incident to the use of these instruments is strictly

forbidden. The gimbal joint cover to the left of the eyepiece, on the underside of the tube, shall not be removed in the field, as the slightest disturbance of the parts inclosed therein will render the instrument inaccurate.

(b) Before mounting the instrument on the tripod, the covers should be rotated to expose the windows.

(c) Do not touch or bump the ends of the instrument when mounted, as the parts at the center will be subjected to undue

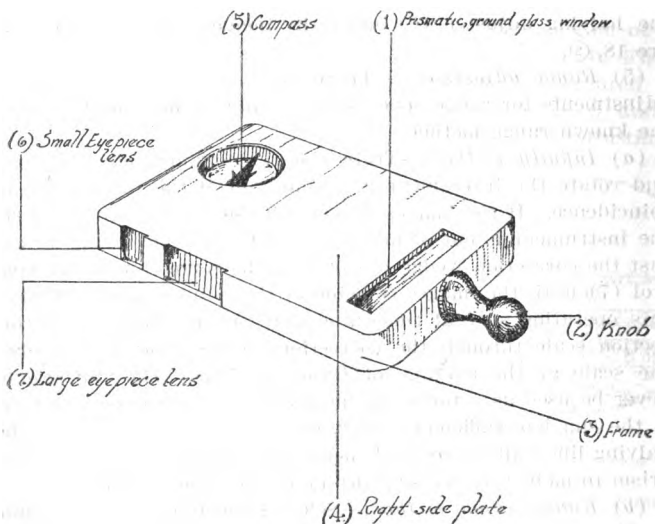


FIGURE 19.—Sitogoniometer

strain tending to shear off the small screws securing the adapter to the tube.

7. Sitogoniometer.—The sitogoniometer (fig. 19), complete, consists of the sitogoniometer and its leather carrying case. It was designed for use by the Field Artillery.

a. Description.—(1) The sitogoniometer is a very small instrument, $3\frac{1}{8}$ by $1\frac{1}{8}$ by $\frac{5}{16}$ inches, weighing, together with its leather case, less than four ounces. It consists of an aluminum frame (3) which includes the left side plate and a right side plate (4), with lenses, scales, and windows set in and held in position by plaster of Paris or similar compound.

(2) The angle-of-site mechanism consists of a small eyepiece lens (6), a mil scale with 10-mil graduations from 50 to 500, another scale to the left which may be disregarded for machine-gun use, a bubble in a glass tube which is bent in the form of an arc, the cord of the arc being horizontal when the instrument is held upright, and a prism behind the eyepiece lens, which causes the bubble tube to appear erect. The light for the bubble and scale enters through the ground glass prismatic window (1) on the lower right side of the instrument. The scale is constructed for use by the Field Artillery, the reading being 300 when the angle of site is zero.

(3) The horizontal angle measuring mechanism consists of a larger eyepiece lens (7) and a mil scale with 10-mil graduations covering a width of 500 mils. The light for this scale comes in from a ground glass window behind the scale and on the opposite edge of the instrument from the eyepiece lens.

(4) A very small box compass (5) is inserted into one corner of the instrument.

(5) On the left side of the instrument is stamped a series of tables for use by the Field Artillery.

b. Use.—The chief use of this instrument is, during reconnaissance, when better instruments are not available, to measure horizontal and vertical angles with a reasonable degree of accuracy and to determine approximate directions.

c. To measure the angle of site.—Grasp the knob (2) between the thumb and forefinger of the right hand and hold the instrument with its longer axis vertical. By dividing the field of vision of one eye in such a manner as to sight through the smaller of the two eyepiece lenses at the mil scale and bubble and at the same time sight along the outside of the instrument at the object to which it is desired to measure the angle of site, incline the instrument forward or backward until the bubble is centered on the 300 graduation of the mil scale. Without moving the instrument, raise or lower the line of vision until it intersects the object and note the reading, on the scale, opposite the object. Since, when the reading on the scale is 300, the angle of site is zero, angles below the horizontal are indicated by readings of less than 300 mils, and angles above the horizontal by readings of more than 300 mils. In machine-gun practice these angles must be converted to plus

or minus angles. For example, if the reading is 285, the angle of site is actually minus 15; if the reading is 320, the angle of site is actually plus 20.

d. To measure the vertical angle between two objects.—Proceed as in *c* above except that the bubble may be disregarded. Using any convenient graduations, take a reading to each of the two objects; subtract the lesser reading from the greater. The difference is the vertical angle between the two objects.

e. To measure the horizontal angle between two points.—Hold the instrument with its larger axis horizontal and the left side down. Divide the field of vision of one eye so as to sight through the larger eyepiece lens at the mil scale and at the same time sight along the side of the instrument at the objects between which it is desired to measure the angle. Line up one of the objects with any convenient graduation on the scale and measure the angle directly. (The scale is divided into 10-mil graduations.)

CHAPTER 2

37-MM. GUN AND 3-INCH TRENCH MORTAR INSTRUMENTS

	Paragraph
Telescopic sight, M1916, for the 37-mm. gun-----	8
Quadrant sight, M1916, for 37-mm. gun-----	9
Bore sights for 37-mm. gun, M1916-----	10
Clinometer, Mk. II, for 3-inch trench mortar, Mk. I (Stokes)-----	11

8. Telescopic sight, M1916, for the 37-mm. gun.—The telescopic sight, M1916, complete, consists of the sight and its carrying case. It is of the fixed focus, straight telescopic erecting type.

a. Description.—The following parts are shown in Figure 20:

(1) The bracket (6) for attaching the sight to the left side of the gun.

(2) The eyepiece (2) which carries the eye lens and is of fixed focus type.

(3) The eye shield (1) made of soft rubber, the purpose of which is to shut out stray light between the eye and the eye lens, and to locate the eye at the proper distance from the eye lens.

(4) The sunshade (3) which slips over the front end of the sight to prevent the entrance of the sun's rays to the object lens.

(5) The range dial (5) graduated in 50-yard divisions from 0 to 1, and in 25-yard divisions from 2 to 18, and numbered every 100 yards.

(6) The deflection dial (4) graduated into 140 equal spaces, each space representing an angle of 1 mil and numbered every 10 spaces, from zero to 70, clockwise and counterclockwise.

b. Use.—The telescopic sight is used for direct laying of the 37-mm. gun.

c. Operation.—When the eye is placed at the eye shield crosslines appear in the field of vision. One line is horizontal and the other inclined to the right of vertical $2^{\circ} 10'$. The crosslines are commonly known as cross hairs. The horizontal line is controlled by the range dial. Setting a number on the range dial opposite the index on the body of the sight lowers the line of aim through an angle which is equivalent to the

angle of elevation, required on the gun, for firing at the range corresponding to the number opposite the index. The vertical line is controlled by the deflection dial. Turning the zero graduation of the deflection dial upward toward the word "right" stamped on the body of the sight will set off right deflection in mils as indicated by the graduation opposite the index on the body of the sight. Turning the zero graduation downward sets off left deflection.

d. To verify the line of sight.—To verify the line of sight with respect to the bore of the gun, bore sight on some object not less than 400 yards distant, then rotate the deflection and range dials until the intersection of the lines (cross hairs) is laid on the object. The deflection dial reading should not ex-

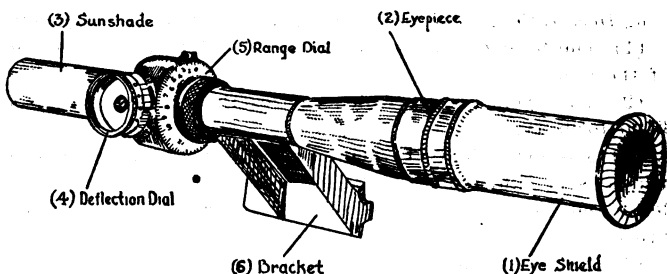


FIGURE 20.—Telescopic sight, M1916, for 37-mm. gun

ceed 5 mils, the maximum allowable error. Note the reading on the range dial and add the range error to the desired range setting. The error in the deflection setting should also be allowed for when setting the deflection dial.

e. Care and preservation.—(1) The dovetail lug on the bracket should not be damaged, burred, or nicked in such a way as to make the assembling of the sight to the carriage bracket difficult.

(2) In wiping dirt or moisture from the eye lens or objective lens it should be done carefully with a soft cloth.

(3) Before inserting the instrument into the carrying case remove both the eye shield and the sun shade. Place the instrument in the case, with the eye lens downward, and insert the shield in the space at the side of the instrument, with the shade inside the shield.

9. Quadrant sight, M1916, for 37-mm. gun.—The quadrant sight, M1916, complete, consists of the sight and its carrying case.

a. Description.—The following parts are shown in Figure 21:

(1) The bracket (2) for attaching the sight to the bracket on the left side of the gun.

(2) The housing (3) pivoted on the bracket; the housing bearing being inclined $2^{\circ} 10'$, which has the effect of turning the sight line through the collimator to the left, automatically correcting for drift for the various ranges when the gun is elevated.

(3) The collimator (5) mounted on top of the housing is pivoted at its forward end and can be rotated horizontally by turning the deflection dial.

(4) The rear lens (4) which magnifies the cross lines on a lens in the front end of the collimator.

(5) The deflection dial (6) graduated into 180 equal spaces, each representing an angle of 1 mil and numbered every 10 spaces from zero to 90 clockwise and counterclockwise from the zero or normal graduation. When the deflection dial is rotated to any desired setting, the line of sighting through the collimator has been displaced to the right or left to an angle of equal amount.

(6) The range dial (1) graduated in 25-yard divisions from zero to 1,800 and numbered every 100 yards.

(7) The angle-of-site dial (8) rotates independently of the range scale. A portion of the periphery is graduated into 140 equal spaces, each representing an angle of 1 mil and numbered every 10 spaces from zero to 70 clockwise and counterclockwise from zero or normal graduation.

(8) An index line engraved opposite the zero graduation in such a manner as to indicate on the outer edge of the range dial.

(9) The level vial (7) for determining the horizontal where indirect laying is used.

b. Use.—The quadrant sight is used principally for indirect laying of the 37-mm. gun.

c. Operation.—(1) For indirect laying, rotate the deflection dial until the graduation corresponding to the desired deflection is opposite the upper index on the housing. Rotate the angle of site dial until the graduation corresponding to the angle of site of the target is opposite the lower index on the

housing. Rotate the range dial until the graduation corresponding to the desired range setting is opposite the index or zero on the angle-of-site dial. Bring the level bubble midway between the graduations on the level vial by means of the elevating mechanism of the carriage, and by means of the traversing mechanism traverse the carriage until the vertical line in the collimator is laid on the aiming point. Check and recenter the bubble if necessary.

(2) For direct laying set the deflection dial at the desired setting, set the angle-of-site dial at zero and rotate the range

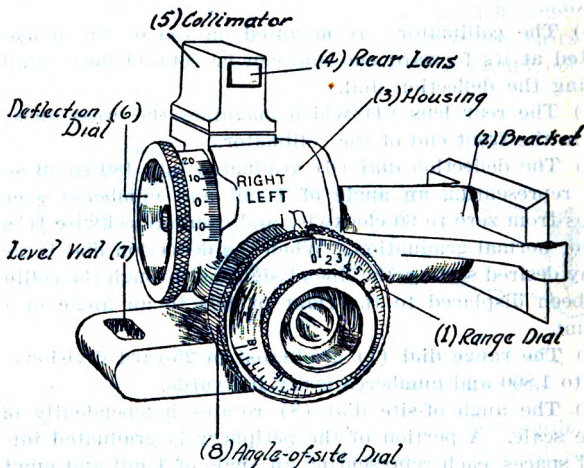


FIGURE 21.—Quadrant sight, M1916, for 37-mm. gun

dial until the desired range is opposite the index on the angle-of-site dial. By means of the elevating and traversing mechanisms lay a quadrant of the cross lines on the aiming point.

d. To use the collimator.—Holding the eye approximately 10 inches in rear of the rear lens, the head is moved vertically or horizontally, causing the eye to view the cross and the target until in coincidence, first in elevation and then in azimuth. It may be more convenient for some men to sight with both eyes open.

e. To adjust the range scale.—Level the gun by means of a clinometer and rotate the range dial until the level bubble is midway between the index lines on the level vial. Set the angle-

of-site dial at zero. Loosen the range dial securing screw and rotate the range dial until the zero coincides with the index, then tighten the screw. If the bubble has not been displaced from its previous setting during this operation, the sight is in adjustment for range. No means are provided for adjusting the deflection scale in the field.

f. Care and preservation.—The dovetail lug on the bracket should not be damaged, burred, or nicked in such a way as to make the assembling of the sight to the carriage bracket difficult.

10. Bore sights for 37-mm. gun, M1916.—The bore sights for 37-mm. gun, M1916 (fig. 22), consist of a breech and muzzle sight.

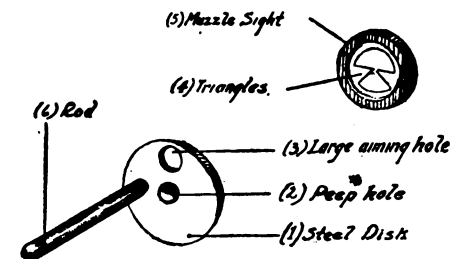


FIGURE 22.—Bore sights for 37-mm. gun, M1916

a. Description. —

(1) The breech sight is a steel disk (1) having a small peep-hole (2) in its center and a larger hole (3) to one side of the center to permit approximate aiming. It also has a short rod (6) riveted to it, to facilitate its plac-

ing in position and withdrawing. In use it occupies a position in the breech chamber of the gun.

(2) The muzzle sight is a steel disk (5) containing a semi-circular opening formed by two triangular pieces (4) projecting toward the center of the disk. A small space between these pieces, which interrupts the diametrical straight edge of the semicircle, indicates the center of the sight. A short rod is riveted to the disk to facilitate its placing in position and withdrawing. In use it occupies a position in the muzzle of the gun.

b. Use.—The bore sights are used to determine the center or axis of the bore of the 37-mm. gun when testing the accuracy of the line of sight of the telescopic sight or quadrant sight in relation to the center of the bore.

c. Operation.—Insert the breech sight in the chamber with the rod to the rear and down. Insert the muzzle sight in the muzzle

with the rod to the front and turn so that the straight-edge of the semicircle is horizontal. Look through the large hole in the rear sight and move the gun until the desired object or aiming point can be seen through the front sight. Then look through the small hole in the rear sight and move the gun until the object appears at the intersection of the hole in the breech sight and the straight-edge of the muzzle sight.

d. Adjustment.—The bore sights are accurately machined when manufactured and no provision for adjustment of them is provided.

e. Care and preservation.—The bore sights shall be kept clean and free from rust. When not in use, they should be kept

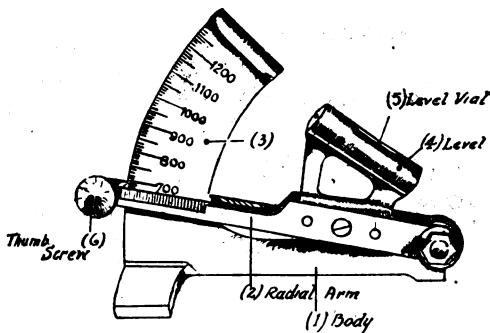


FIGURE 23.—Clinometer, Mk. II, for 3-inch trench mortar, Mk. I (Stokes)

slightly oiled, and, if stored for any length of time, they should be coated with a heavy grease and packed in such a manner as to prevent their being damaged from other metallic articles.

11. Clinometer, Mk. II, for 3-inch trench mortar, Mk. I (Stokes).—The clinometer, Mk. II (fig. 23), complete, consists of the clinometer and its carrying case. (There are a number of clinometers, Mk. I, in service; these are graduated in degree and half-degree spaces from 36 to 73 and numbered every 10 degrees from 40 to 70.)

a. Description.—(1) The clinometer is constructed principally of two parts; a sector-shaped body (1) and a radial arm (2).

(2) The base of the body is machined to a cylindrical shape to fit evenly on the mortar barrel. The rear end extends upward in the form of an arc, on both sides of which scales (3)

are secured, graduated in 10-mil spaces from 640 to 1,300 and numbered every 100 mils from 700 to 1,200.

(3) One end of the radial arm is pivoted at the front end of the body opposite to the arc and carries the level (4). The rear end straddles the graduated scales and contains fiducial edges for indicating on same. It can be clamped in the desired position by the thumbscrew (6).

b. Use.—The clinometer is for use in laying the 3-inch trench mortar, Mk. I (Stokes), in elevation.

c. Operation.—To lay the trench mortar at a given angle of elevation proceed as follows:

(1) Set the upper beveled edge of the radial arm at the desired graduation on the scale and clamp by means of the thumbscrew.

(2) Place the clinometer on the seating provided on the mortar barrel (marked by a white line) with the arc-shaped end to the rear and resting against the band.

(3) Operate the elevation handle of the mortar until the level bubble is central with the index line on the level vial.

d. Adjustment.—No means are provided to alter the adjustment of the clinometer in the field.

e. Care and preservation.—(1) The fiducial cylindrical surfaces which rest upon the mortar barrel should be well taken care of and not burred or damaged in such a way as to cause inaccuracies of the instrument. Care will also be taken to prevent the glass level vial from being broken.

(2) The instrument shall always be removed from the mortar before firing.

CHAPTER 3

CARE, REPAIR, AND ADJUSTMENT OF INSTRUMENTS

	Paragraph
Care and preservation of instruments.....	12
Minor repair and adjustment of instruments.....	13

12. Care and preservation of instruments.—To take proper care of an instrument, the person charged with its use should familiarize himself with the methods of mounting, functioning, use, and adjustment of the instrument.

a. Care in handling.—(1) Fire-control instruments contain delicate mechanisms and accurately arranged optical parts and should be handled carefully to avoid any unnecessary shocks which would tend to jar the instruments out of adjustment and render them unserviceable.

(2) Instruments provided with carrying cases, chests, or boxes should be properly placed therein, without undue force, when not in use.

b. Responsibility for care.—The individual to whom an instrument is issued is responsible to the commander for its care and preservation. The commander may have such adjustments made as are authorized for each instrument.

c. Disassembling.—(1) No disassembling of any fire-control instrument is permitted other than that specifically authorized in this chapter or that required for repair work as prescribed in paragraph 13.

(2) Under no circumstances will the disassembling of any instrument, or part thereof, be permitted by any person unless he is a skilled mechanic familiar with fire-control instruments.

(3) All unnecessary turning of screws, knobs, or other movable parts, not incident to the use of the instrument, is strictly forbidden.

(4) Instruments which fail to function properly should be returned by authority of the ordnance officer to an ordnance repair shop for repairs.

(5) Assembling screws and nuts must not be removed unless specific instructions so direct. When originally assembled these parts are usually coated with some substance to make

them hold better or to give a moisture-proof seal. When, as will occasionally happen, an assembling screw or nut works loose, the commander should have it tightened to prevent its loss. In doing this work care must be exercised in selecting suitable tools and avoiding overstrain and deformation of the parts.

d. Oiling.—(1) All interior moving parts of fire-control instruments are oiled or greased when assembled, such oiling or greasing being sufficient to last for a considerable length of time. Such moving or exposed parts requiring oiling or greasing should be lubricated sparingly with the lubricants specified by the Ordnance Department for fire-control instruments and none other. Care should be taken that no oil reaches the optical parts or other parts that do not require lubrication. Wipe off all excess lubricant that seeps from the mechanisms in order to prevent the collection of dust and grit.

(2) Care should be exercised to prevent the breaking or cracking of glass windows, lenses, or level vials, as these parts when damaged will invariably render an instrument unserviceable until they are replaced.

e. Care of lenses and other glass surfaces.—(1) To obtain satisfactory vision, the surfaces of lenses and windows must be kept clean, dry, and free from scratches. Scale windows and level vials should also be kept clean to aid in making accurate readings.

(2) Clean soft rags, tissue paper, or chamois skin and camel's-hair brushes, free from grit, dust, and lint, should be used for cleaning all glass surfaces to avoid scratching.

(3) Under no circumstances will polishing liquids, pastes, or abrasives be used for polishing lenses or scales.

(4) To remove oil or grease from lenses or other glass surfaces, apply alcohol with a rag or camel's-hair brush and rub off gently with a clean rag or lens paper. If alcohol is not available, breathe heavily on the glass and wipe with a rag or lens paper, repeating the operation until the surface is clean.

(5) To remove dust, brush lightly with a camel's-hair brush and rap the brush against a hard body to knock out the particles of dust which cling to the hairs. Continue this operation until the dust is removed.

(6) Do not wipe off the lenses or windows with the fingers.

(7) Occasionally moisture collects on the inner surfaces of the lenses, objective windows, or scale windows of optical in-

struments, due to condensation caused by the temperature of the air inside the instrument being higher than the surrounding air. In case this is noticed, place the instrument in a warm place, which usually removes the moisture. Heat from artificial sources should never be applied directly, as it may cause unequal expansion of parts, resulting in inaccuracies in observation.

f. Protection from weather.—Instruments should be protected from wet weather as much as possible and when used during a rain should be wiped off with a cloth as soon as possible after the rain ceases. Instruments should never be returned to their cases wet and should be stored in a warm, dry place when practicable.

13. Minor repair and adjustment of instruments.—*a. Repair.*—The only repairs to be performed within the Infantry, except those prescribed in the descriptive matter of the individual instrument, are the replacement of such parts as are indicated by the symbol (%) in the Standard Nomenclature Lists. Such parts are obtainable. They may ordinarily be replaced with simple tools such as screw drivers and wrenches, but care is necessary in the selection of suitable tools to avoid deformation of parts.

b. Adjustment.—The only adjustments, if any, permitted in the field by the company armorers are stated in the descriptions of the individual instruments.

INDEX

	Paragraph	Page
Aiming circle, M1916:		
Adjustments.....	1	14
Angle of site to an object, how measured.....	1	12
Care and preservation.....	1	15
Declination.....	1	13
Description.....	1	7
Horizontal line between two objects, how measured.....	1	11
Laying gun for position.....	1	12
Magnetic azimuth to a point, how measured.....	1	12
Setting up the instrument.....	1	11
Use.....	1	11
Angle-of-site instrument, M1917:		
Adjustments.....	2	18
Angle of elevation, how measured.....	2	18
Angle of site to an object, how measured.....	2	17
Care and preservation.....	2	19
Description.....	2	16
Laying gun.....	2	18
Test of.....	2	18
Use.....	2	17
Bore sights for 37-mm. gun, M1916:		
Adjustment.....	10	48
Care and preservation.....	10	48
Description.....	10	47
Operation.....	10	47
Use.....	10	47
Clinometer, Mk. II, for 3-inch trench mortar, Mk. I (Stokes):		
Adjustment.....	11	49
Care and preservation.....	11	49
Description.....	11	48
Operation.....	11	49
Use.....	11	49
<i>See also Machine-gun clinometer, M1917.</i>		
Field glass, type EE:		
Auxiliary aiming mark.....	3	21
Care.....	3	23
Description.....	3	19
Determination of troop safety for overhead fire.....	3	22
Focus of the eyepiece.....	3	20
Operation.....	3	20
Use.....	3	20

	Paragraph	Page
Gun, 37-mm., instruments.....	8-11	43-49
Instruments:		
Care and preservation.....	12	50
Disassembling.....	12	50
Handling, care in.....	12	50
Lenses and glass surfaces, care of.....	12	51
Minor repair and adjustment.....	13	52
Oiling.....	12	51
Protection from weather.....	12	52
Responsibility for care.....	12	50
Lensatic compass, M1918:		
Adjustments.....	4	28
Azimuth from the observer to a given point, how measured.....	4	25
Back azimuth, how determined.....	4	25
Care and preservation.....	4	28
Declination of compass and application of the declination constant..	4	27
Description.....	4	24
Determination of horizontal angle with two points subtend from the position of the observer.....	4	26
Given an azimuth to a given point, to find a position from which the given point is on that azimuth.....	4	26
Given the azimuth from a given point, to find a position which is on that azimuth from a given point.....	4	26
Laying off a line of a given azimuth from the position of the observer.	4	26
Night operation.....	4	26
Operation.....	4	25
Use.....	4	25
Machine-gun clinometer, M1917:		
Angle of elevation, how measured.....	5	29
Care and preservation.....	5	31
Description.....	5	28
Laying gun at a given elevation.....	5	29
Test of.....	5	30
Use.....	5	29
Machine-gun instruments.....	1-7	7-40
Quadrant sight, M1916, for 37-mm. gun:		
Adjustment on range scale.....	9	46
Care and preservation.....	9	47
Collimator, use of.....	9	46
Description.....	9	45
Operation.....	9	45
Use.....	9	45
Range finders:		
General.....	6	31
M1914, 80-centimeter base, range roller type—		
Description.....	6	32
Halving adjustment.....	6	36

Range finders—Continued.

	Paragraph	Page
M1914, 80-centimeter base, etc.—Continued.		
Observation of an object.....	6	35
Range adjustment.....	6	36
Setting up the instrument.....	6	35
Tripod, type R.....	6	33
Tripod, type S.....	6	34
M1917, 80-centimeter base, azimuth type—		
Description.....	6	37
Halving adjustment.....	6	39
Observation of an object.....	6	38
Range adjustment.....	6	39
M1918, 80-centimeter base, range roller type—		
Care and preservation.....	6	39
Description.....	6	39
Sitogoniometer:		
Angle of site, how measured.....	7	41
Description.....	7	40
Horizontal angle between two points, how measured.....	7	42
Use.....	7	41
Vertical angle between two objects, how measured.....	7	42
Telescopic sight, M1916, for 37-mm. gun:		
Care and preservation.....	8	44
Description.....	8	43
Line of sight, how verified.....	8	44
Operation.....	8	43
Use.....	8	43
Trench mortar, 3-inch, instruments.....	8-11	43-49



Stanford University Libraries



3 6105 122 871 002

